ACRP
SYNTHESIS 27

Airport Self-Inspection Practices

A Synthesis of Airport Practice

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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TRANSPORTATION RESEARCH BOARD

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principle means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). The ACRP carries out applied research on problems that are shared by airport operating agencies and are not being adequately addressed by existing federal research programs. It is modeled after the successful National Cooperative Highway Research Program and Transit Cooperative Research Program. The ACRP undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration. The ACRP provides a forum where airport operators can cooperatively address common operational problems.

The ACRP was authorized in December 2003 as part of the Vision 100-Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International–North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), and the Air Transport Association (ATA) as vital links to the airport community; (2) the TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academies formally initiating the program.

The ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

Research problem statements for the ACRP are solicited periodically but may be submitted to the TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

Once selected, each ACRP project is assigned to an expert panel, appointed by the TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended end-users of the research: airport operating agencies, service providers, and suppliers. The ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties, and industry associations may arrange for workshops, training aids, field visits, and other activities to ensure that results are implemented by airport-industry practitioners.

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The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. **www.TRB.org**

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Cover photo: Operations personnel examine a taxiway edge light during a daily self-inspection. Used with permission.

FOREWORD

Airport administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the airport industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire airport community, the Airport Cooperative Research Program authorized the Transportation Research Board to undertake a continuing project. This project, ACRP Project 11-03, "Synthesis of Information Related to Airport Practices," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an ACRP report series, *Synthesis of Airport Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE
By Gail R. Staba
Senior Program Officer
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Airport self-inspections, which are required at airports certificated under Title 14, Code of Federal Regulations (CFR) Part 139 (Part 139), allow an airport to ensure regulatory compliance on a daily basis and are seen by the FAA as the cornerstone to the airport operator's overall safety program. Although not required by Part 139, noncertificated airports typically have in place some degree of a self-inspection program. This practice is encouraged by the FAA and enables an airport to ensure safety of the airfield and compliance with various standards. Generally, all airports, whether or not certificated under Part 139, use this regulation as a baseline for a self-inspection program.

For the purposes of this synthesis, a comprehensive self-inspection program includes the components of training; inspecting; reporting discrepancies and findings; follow-up, resolution, and close-out; and quality control. The report provides insight into common airport self-inspection practices and may be useful to airports in benchmarking their self-inspection program to peer airports and practices considered successful by regional FAA personnel.

C. Daniel Prather, Prather Airport Solutions, Inc., Murfreesboro, Tennessee, collected and synthesized the information and wrote the report. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

AIRPORT SELF-INSPECTION PRACTICES

SUMMARY

Inspections are vital to any industry that values safety and endeavors to enhance quality. Without a thorough self-review, opportunities for improvement or correction may be missed or ignored altogether. In the aviation industry inspections are especially critical, as the industry is responsible for safely transporting hundreds of thousands of people across the globe on a daily basis. Among airports, self-inspections are an important aspect of any safety program.

Self-inspections, which are required at airports certificated under Title 14, Code of Federal Regulations Part 139 (Part 139), allow an airport to ensure regulatory compliance on a daily basis and are seen by the FAA as the cornerstone of the airport operator's overall safety program. During a self-inspection, primary attention is given to such operational items as pavement areas, safety areas, markings, signs, lighting, aircraft rescue and firefighting, fueling operations, navigational aids, ground vehicles, obstructions, public protection, wildlife hazard management, construction, and snow and ice control.

In the United States, the FAA is responsible for overseeing self-inspection programs in place at airports certificated under Part 139. This oversight is carried out by a team of nearly 40 FAA airport certification safety inspectors throughout the nine FAA regions, through an on-site inspection process. This inspection typically occurs annually, but may also occur unannounced at any time. To determine the airport's compliance with Part 139, the inspector reviews airport files, including the Airport Certification Manual, self-inspection forms, training records, and Notices to Airmen; and conducts a movement area inspection, an aircraft rescue and firefighting inspection, a fueling facilities inspection, and a night inspection.

Although one is not required by Part 139, non-certificated airports typically have in place some degree of a self-inspection program. This practice is encouraged by the FAA and enables an airport to ensure airfield safety and to comply with various standards. Generally, all airports, whether or not certificated under Part 139, use this regulation as a baseline for a self-inspection program.

Although there are similarities among airports regarding their self-inspection programs and the training of personnel to carry out these programs, wide variation exists among airports in these areas. The objective of this synthesis was to review and compile current practices among airports regarding self-inspection programs. For the purposes of this synthesis, a comprehensive self-inspection program includes the components of training; inspecting; reporting discrepancies and findings; follow-up, resolution, and close-out; and quality control. This report is intended mainly for airport operators, including those personnel charged with conducting airport self-inspections, and the management and staff responsible for Part 139 compliance, including the self-inspection program and the training of personnel to implement that program. Additionally, senior airport officials, state and local officials, airport board members, and members of the media may find aspects of the report informative.

This synthesis consists primarily of a literature-based review of airport self-inspection guidance and regulations, as well as current airport self-inspection practices. Sources for the literature review include the FAA, U.S.DOT, various state aviation agencies, relevant

studies on self-inspection procedures and training practices, sample airport self-inspection checklists, and state and federal checklists.

To supplement this review of literature, three unique questionnaires were developed specific to this project. First, 40 U.S. airports were selected to receive a 40-item questionnaire. With a response rate of 83%, valid data were obtained from 33 airports in this group on all components of an airport self-inspection program; they are detailed in this report. Second, the lead airport certification safety inspector in each of the nine FAA regions was surveyed using a seven-item questionnaire. Responses from seven of the nine regions provide insight into the FAA oversight of airport self-inspection programs and common practices within each region. Lastly, each of the state aviation agencies was surveyed with a 14-item questionnaire. Responses from 49 of the 50 U.S. states provide insight into state-level oversight of non-certificated airports. In addition, a number of representatives from the FAA and the topic panel provided input for this report.

Summary findings from this synthesis, representing 33 airports throughout the United States, as well as seven FAA airport lead certification safety inspectors and 49 state aviation agencies, are as follows.

TRAINING

- Both initial and recurrent training are provided in-house at the majority of airports.
- Operations personnel conduct self-inspection training at the majority of airports.
- Most airports follow Part 139 guidelines by conducting initial training as personnel are hired, and recurrent training annually.
- At most airports, operations personnel comprise the employee group receiving all components of Part 139 training.
- For initial training, most airports rely on on-the-job training and self-study.
- For recurrent training, most airports rely on on-the-job and interactive training.

INSPECTING

- Most airports conduct inspections visually, with one person in a vehicle and a paper self-inspection checklist.
- Most airports utilize a varied inspection pattern and conduct both night and day inspections.
- Operations personnel conduct self-inspections at most airports.
- Most airports allow tenant personnel to ride along on self-inspections by request only.

REPORTING DISCREPANCIES AND FINDINGS

- Most airports use some form of electronic work order system to report discrepancies.
- Some airports have incorporated a geographic information system into the reporting process to allow exact coordinates of located discrepancies.

FOLLOW-UP, RESOLUTION, AND CLOSE-OUT

- Most airports use some form of electronic work order system to follow up on reported discrepancies, with many also confirming resolution by e-mail or face-to-face.
- Visual verification of completed work often follows a closed-out work order.

QUALITY CONTROL

- To minimize complacency among inspection personnel, most airports emphasize training and proper management oversight.

- Of the human factors identified in the study, complacency and fatigue have the most significant impact on self-inspection personnel and their ability to carry out an airport self-inspection program.

OVERSIGHT

- Seven of the nine FAA regions have observed many common practices related to self-inspections and the training of inspection personnel.
- The vast majority of state aviation agencies are responsible for inspecting (whether annually, biennially, or triennially) the non-certificated, public-use airports within their state.
- Most states issue an airport license.
- The four areas receiving the most focus from state aviation agencies during an inspection are markings, signs, and lighting; obstructions; pavement areas; and safety areas.

The report provides insight into common airport self-inspection practices and may be useful to airports in benchmarking their self-inspection programs to peer airports and practices considered successful by regional FAA personnel.

INTRODUCTION

BACKGROUND

In considering the features of a sound aviation system, issues such as regulatory compliance, effective management, and safety are integral. However, safety is the most integral aspect of the aviation system: without it, the system fails; with it, the system prospers. Airports, hosting every aircraft departure and arrival, provide a critical safety link in this aviation system. It is critical, therefore, for airports to place a high emphasis on safety and ensure a safe operating environment for aircraft, vehicles, and personnel. According to the FAA, a self-inspection program is the cornerstone of an airport operator's overall safety program (B. Landry, personal communication, Jan. 12, 2010).

SELF-INSPECTION PROGRAM OVERVIEW

Self-inspection programs are integral for airports in (1) maintaining regulatory compliance, (2) ensuring various standards are met, and (3) contributing to aviation safety. Specifically, self-inspection programs are designed as a means by airports to identify unsatisfactory conditions and take the necessary action to correct these conditions. As explained by the FAA:

> While some hazardous airport conditions develop virtually instantaneously, others are gradual. It is important that the airport operator have an airport safety self-inspection program that monitors specific airport conditions in order to identify unsatisfactory conditions for prompt corrective actions (FAA 2004, p. 2).

Although self-inspection programs vary among airports in scope and effectiveness, comprehensive self-inspection programs contain the following elements:

- Training of personnel;
- Inspection component
  - Inspection
  - Reporting discrepancies and findings
  - Follow-up
  - Resolution
  - Close-out; and
- Quality control.

Discussed in detail within this report, each of these components is essential for an effective airport self-inspection program. However, as will be discussed, airports have wide discretion in the methods they adopt for their self-inspection program: whether one individual or a team of individuals conducts an inspection, whether a runway inspection is conducted once each day or six times each day, whether the self-inspection checklist is in paper form or on a vehicle-mounted tablet PC, or whether training is conducted in-house or outsourced. One purpose of this report is to highlight these differences as well as the similarities among airports in carrying out their self-inspection programs.

FAA REGULATORY REQUIREMENTS

To ensure airport safety, the FAA provides oversight of airports served by air carriers through Title 14, Code of Federal Regulations (CFR) Part 139 (Part 139). Compliance with Part 139 is mandatory for an operator of a U.S. airport that chooses to serve air carrier operations covered by the regulation. Specifically, Part 139 applies to airports in any state of the United States, the District of Columbia, or any territory or possession of the United States serving passenger-carrying operations of an air carrier certificated under 14 CFR Part 121 and 14 CFR Part 380 if:

- Scheduled passenger-carrying operations are conducted with aircraft designed for more than nine passenger seats; and
- Unscheduled passenger-carrying operations are conducted with aircraft designed for at least 31 passenger seats (Certification of Airports 2004).

Part 139 is applicable in the state of Alaska only to airport operators serving scheduled or unscheduled passenger operations of an air carrier with aircraft with a seating capacity of more than 30 passengers (FAA 2004). Airport operators can choose not to be certificated under Part 139. However, compliance with Part 139 is mandatory if the airport operator chooses to serve the air carrier operations previously noted. Alaskan airports that serve air carrier aircraft with 30 seats or less are exempt from federal airport certification requirements.

Compliance with this regulation is ensured through the granting of an Airport Operating Certificate (AOC). To obtain a certificate, an airport must agree to certain operational and safety standards and provide for certain equipment and facilities. An AOC issued under Part 139 is effective until the certificate holder surrenders it or the certificate is suspended or revoked by the Administrator of the FAA.

TABLE 1
AIRPORT CERTIFICATION STATUS

	Class I	Class II	Class III	Class IV
Number of Airports	381	50	35	87

With the revision of Part 139 in 2004, four classes of airports were developed. Class I airports are those airports serving all types of scheduled operations of air carrier aircraft designed for at least 31 passenger seats and any other type of air carrier operations. Class II airports are those airports that serve scheduled operations of small air carrier aircraft and unscheduled operations of large air carrier aircraft. Class II airports are not permitted to serve scheduled large air carrier operations. Class III airports are those airports that serve only scheduled operations of small air carrier aircraft. Class IV airports are those airports that serve only unscheduled operations of large air carrier aircraft. Class I, II, and IV airports are those that held a Part 139 AOC before the 2004 revision. Class III airports are those that were newly certified (FAA 2010). As of 2010, there were 553 airports certified under Part 139. Table 1 shows the number of airports in each class.

To comply with Part 139, certified airports are required to develop an Airport Certification Manual (ACM). Designed as an airport-specific extension of Part 139, the ACM is written by an airport to define specifically how it will comply with Part 139. The ACM must be submitted to the FAA for approval. Once the ACM is approved, the airport can and must do what is spelled out in its ACM (Lammerding 2009). Although each airport requires an approved ACM, the requirements differ slightly among airport classes. However, each airport is required to address Part 139.327 procedures for conducting the self-inspection program within its ACM.

As specified in Part 139.105, the FAA holds inspection authority over certified airports. According to Part 139.105, "Each applicant for, or holder of, an Airport Operating Certificate must allow the Administrator to make any inspections, including unannounced inspections, or tests to determine compliance with 49 U.S.C. 44706 and the requirements of this part" (Certification of Airports 2004). Although the FAA is responsible for ensuring that these certified airports comply with Part 139, it is not possible for the FAA to monitor the operations of each certified airport daily; thus, the need for airport self-inspections. As spelled out in AC 150/5200-18C, *Airport Safety Self-Inspection,* "One of the requirements of Part 139 is that the operator of each certified airport regularly conduct a daily safety self-inspection to ensure that prompt corrective action is taken to eliminate unsafe conditions on the airport" (FAA 2004, p. 2). Self-inspections serve two purposes. First, they allow an airport to ensure compliance with Part 139 on a daily basis. Second, they allow an airport to discover existing or potential discrepancies and initiate action to resolve these discrepancies before airport safety is adversely affected.

However, with 4,150 publicly owned, public-use airports in the United States and only 553 certified airports, it is clear that the majority of U.S. airports need not comply with the requirements of Part 139 or with AC 150/5200-18C. Although the requirements of Part 139 are mandatory for a holder of a Part 139 Airport Operating Certificate and AC 150/5200-18C represents an acceptable means of compliance with the self-inspection requirements of Part 139, the FAA notes that the regulation and AC contain many safety practices and recommends these practices for use at all airports, including those airports not holding an AOC under Part 139. It can be noted, however, that if any airport accepts Airport Improvement Program funding, the airport operator is held to grant assurances.

Even so, there is no federal oversight of self-inspection programs at non-certified airports. However, in many states, the state aviation agency (i.e., department of transportation) may assume this inspection authority. Some states even license airports, so that their oversight has some consequence. Regardless, whether certified or not, airport self-inspection programs have many similarities among airports and serve the same purpose of ensuring that the airport is operating safely and is complying with regulatory requirements.

The regulatory requirements for an airport self-inspection program are spelled out in Part 139.327, entitled Self-Inspection Program. This section of the regulation addresses both the inspection and training processes. Regarding inspections, each certificate holder must:

1. Inspect the airport according to the following schedule:
   a. Daily, unless specified otherwise in the ACM;
   b. When required by any unusual condition, such as construction activities or meteorological conditions that may affect safe air carrier operations; and
   c. Immediately after an accident or incident.
2. Provide the following:
   a. Equipment for use in conducting safety inspections;
   b. Procedures, facilities, and equipment for rapid and reliable dissemination of information between the certificate holder's personnel and air carriers;
   c. Procedures to ensure that qualified personnel perform the inspections; and
   d. A reporting system to ensure prompt correction of unsafe airport conditions noted during the inspection, including wildlife strikes (FAA 2004).

Additionally, the section mentions that FAA advisory circulars contain methods and procedures for conducting airport self-inspections that are acceptable to the Administrator.

FAA GUIDANCE

The FAA has issued numerous Advisory Circulars (ACs) designed to guide airports in complying with various federal regulations. Some ACs are mandatory. ACs that contain mandatory guidance are relatively defined and present the only way in which an airport may comply. Most ACs present information that is advisory in nature, leaving specific techniques up to the airport operator. In other words, there are often many ways an airport operator may comply with a regulation. These are to be spelled out within the "applicability" section of an AC. In any event, the regulatory requirement for complying with an AC stems not from the AC itself, but from the airport's ACM, as approved under Part 139. Series 150 ACs (for airport projects) aid airport operators in developing methods to comply with Part 139 by providing airports with guidance as well as specific standards. As of this writing, there are 127 ACs in the 150 series. ACs are frequently updated; therefore, airports are encouraged to access the most current version of an AC at the FAA website, http://www.faa.gov.

The most beneficial AC regarding the topic of this synthesis is AC 150/5200-18C, *Airport Safety Self-Inspection.* This AC is the most important document, second only to Part 139, for airports conducting self-inspections. This AC provides guidance for airport operators in developing airport self-inspection programs that facilitate regulatory compliance with Part 139 on a day-to-day basis. Even so, the programs currently in use by airports ". . . vary in scope and effectiveness from verbal instructions and unscheduled and unrecorded inspections to very comprehensive inspection programs with multiple daily schedules and widely distributed responsibilities" (FAA 2004, p. 2).

In providing guidance in developing a self-inspection program, AC 150/5200-18C addresses inspection frequencies, inspection records, inspection techniques, knowledge and equipment, and the airport physical facilities and areas that should be inspected during each type of inspection. Although an excerpt from this AC is included in Appendix N, specific requirements are detailed in each chapter as appropriate.

In addition to ACs, CertAlerts are designed to give the FAA Airports Safety and Operations Division an efficient method of providing information on issues related to Part 139. By definition, CertAlerts are advisory, cautionary, and nondirective in nature, and may be accessed on the FAA website at http://www.faa.gov/airports/airport_safety/certalerts/. CertAlerts may simply be reminders about the need for foreign object debris (FOD) detection and removal (as in CertAlert No. 09-06), or may follow an aircraft accident involving an aircraft colliding with construction equipment while attempting to depart on a closed runway (as in CertAlert No. 02-01). Of the 77 CertAlerts that have been issued during the 8.5-year period between 2002 and June 30, 2010, 22 address some aspect of self-inspections or training programs. Specifically,

the majority of these 22 address fuel safety training, and one (09-06) addresses FOD.

CertAlert No. 09-06, Closing active runway for FOD checks increases safe operations

To prevent future occurrences of airports not removing FOD from runways in a timely manner or allowing aircraft operations on a runway contaminated with FOD, the FAA Office of Safety and Standards issued an advisory CertAlert in March 2009. Airports are not required to abide by this CertAlert, but they are cautioned not to continue aircraft operations on contaminated surfaces. Although specifically addressing FOD, the CertAlert does challenge airport operators with regard to self-inspections:

> In an effort to avoid damage to aircraft, airports are reminded of their obligation to maintain safe movement areas throughout their facilities. This should include procedures for [e]ffecting immediate runway closures in the presence of certain types of FOD, such as large pieces of metal, large aggregate, large concrete spalling pieces, or any other materials likely to pose a high risk for operator.

Source: FAA 2009.

ADDITIONAL GUIDANCE

In addition to FAA guidance on self-inspections, various industry publications and conferences, courses, and workshops are available to help airports develop self-inspection programs and carry out self-inspection duties. One such publication is ACRP S04-06, *Current Airport Inspection Practices Regarding FOD.* Although S04-06 addresses managing FOD at airports, it contains information on technology and equipment for conducting self-inspections and for documenting findings.

TRAINING OF INSPECTION PERSONNEL

Based on the requirements of Part 139, the training of personnel is integral to an effective self-inspection program. Indeed, only those personnel who have met the training requirements can perform the daily self-inspection (Lammerding 2010a). According to Part 139.303(c), this training must be completed before the initial performance of duties and at least once every 12 consecutive calendar months. Initial training is typically arranged for new personnel to enable them to learn the airport's unique characteristics and the requirements of Part 139 (specifically, the airport's self-inspection program as spelled out in the ACM) before being allowed to perform self-inspection duties. Initial training can be accomplished in a number of ways, some of which include on-the-job training, videos, tests, self-study, electronic or web-based interactive training, conferences, and workshops.

Likewise, airports have an equal number of options for recurrent training. Regardless of which training methods are employed, training is an integral component of all self-inspection programs.

Quality is an important component of a training program. Maintaining quality control requires that airports address complacency, as well as stress the importance of self-inspections, to ensure a successful self-inspection program. Otherwise, poor employee habits may develop and airfield safety may suffer as a result.

SCOPE OF STUDY

The scope of this synthesis is current airport self-inspection procedures and training practices. Specifically, this project focused on the following components of a complete airport self-inspection program:

- Training (initial and recurrent);
- Inspecting;
- Reporting discrepancies and findings;
- Follow-up, resolution, and close-out; and
- Quality control.

This synthesis focuses broadly on the manner in which (1) self-inspections are conducted and (2) responsible personnel are trained. Each chapter presents guidance in these areas (based on the literature) as well as in current airport practices (based on survey data). Additionally, chapter seven presents insights into the oversight of certificated airports by the FAA and non-certificated airports by state aviation agencies.

STUDY METHODOLOGY

Information used in this study was acquired through an extensive literature and data review, three surveys, follow-up interviews with survey respondents, contributions from panel members, and the author's professional knowledge of the subject area.

A literature and data search was conducted to document regulations and guidance for conducting airport self-inspections at certificated airports. This search focused on (1) Part 139, (2) relevant state and federal regulations on the subject matter, (3) other federal guidance such as CertAlerts and Advisory Circulars, and (4) relevant literature in the form of books, magazines, reports, and surveys conducted on the various aspects of self-inspection programs and training.

Three unique questionnaires were developed to survey airport operators, lead FAA airport certification safety inspectors, and state aviation agencies. The first questionnaire, entitled "Airport Self-Inspection Survey," can be found in Appendix D. This questionnaire was designed to solicit responses from airport managers or operations personnel regarding their current self-inspection practices and training techniques. Specifically, the questionnaire was designed to determine the methods and tools used to perform self-inspections, methods used by airports in initial and recurrent training of inspection personnel, the manner in which discrepancies are addressed, and the degree to which human factors are an issue in airport self-inspection programs.

The second questionnaire, entitled "FAA Inspection Survey," can be found in Appendix E. The questionnaire was sent to the lead airport certification safety inspector in each of the nine FAA geographical regions. The purpose of this questionnaire was to supplement airport-specific information with FAA regional insight. Specifically, inspectors were asked to provide examples of successful airport inspection and training practices from their respective regions. This survey also sought to understand what differences exist, if any, among the FAA geographical regions in regard to self-inspection requirements.

The third questionnaire, entitled "Airport Oversight by State Aviation Agencies," is in Appendix F. This questionnaire was designed to supplement perspectives on FAA oversight (typically appropriate to certificated airports) with perspectives on state oversight (typically appropriate for non-certificated airports). Because practices vary substantially by state, this survey was designed to make sense of the practices in place in each state.

In summary, information for this synthesis was gathered from a literature review and three survey questionnaires. Owing to this, considerable effort was exerted to ensure that the methodology for the survey implementation was both sound and strategically orchestrated. First, to facilitate the distribution of the questionnaires and simplify the responses, the questionnaires were developed and distributed using a web-based survey tool. Potential participants were invited to join the study by means of an e-mail invitation. Second, to obtain a nationwide representation of airports, the population was stratified into the nine FAA regions. Within each region, airports were selected from the following categories, as possible: large hub, medium hub, small hub, non-hub, and general aviation (GA). This selection process yielded a total sample size of 40. Likewise, the lead certification inspector from each of the nine FAA regions was invited to participate. In gathering information from state aviation agencies, each of the 50 states was invited to participate in the survey, rather than only a selection of states.

PARTICIPANTS

Airports

Data were collected from 33 airports of the 40 that chose to respond, which resulted in a survey response rate of 83%. Appendix A lists the airports participating in the study. As seen in Figure 1, the study garnered responses from each of the nine FAA regions.
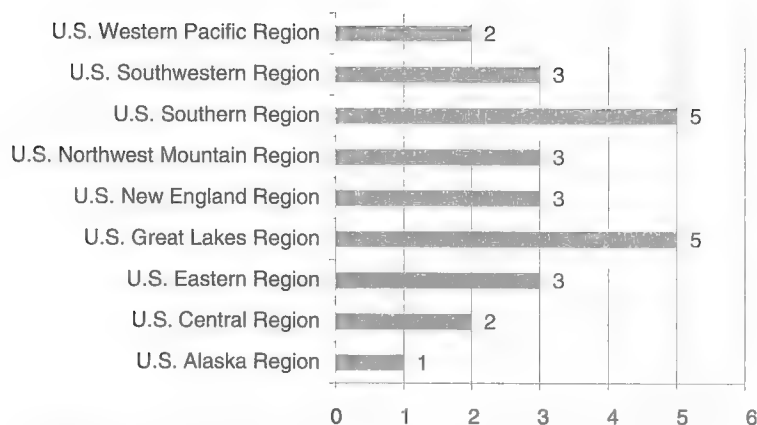
FIGURE 1 Airport respondents' self-selected FAA regions. Six participants did not indicate a region.

In addition to the wide geographic distribution of respondents, the airports participating in this synthesis were adequately representative of airports of almost any size. Figure 2 presents airport respondents by airport category or hub size. It should be noted that the majority of participants represent large-hub airports. As a result, findings are not necessarily generalizable to airports of all sizes.

In addition to categorization by hub size, responding airports were categorized by number of operations. The airports participating in this synthesis also adequately represent a wide range of airports in terms of annual operations. Figure 3 presents airport respondents by annual operations.

Lastly, in an effort to understand fully the airports participating in the synthesis, participants were asked about their airport certification status. Although the majority of participating airports were larger Class I airports (according to

Part 139 classification), other categories were represented as well. Figure 4 presents airport respondents by certification.

FAA Inspectors

Data were collected from seven of the nine FAA regions, which resulted in a response rate of 78%. Appendix B presents the list of participating FAA regions.

State Aviation Agencies

Data were collected from 49 state aviation agencies, resulting in a response rate of 98%. Appendix C presents the list of states participating in the study. Additionally, to determine the degree of oversight (by number of airports), participating states were asked how many airports they were responsible for inspecting. Results are shown in Figure 5.
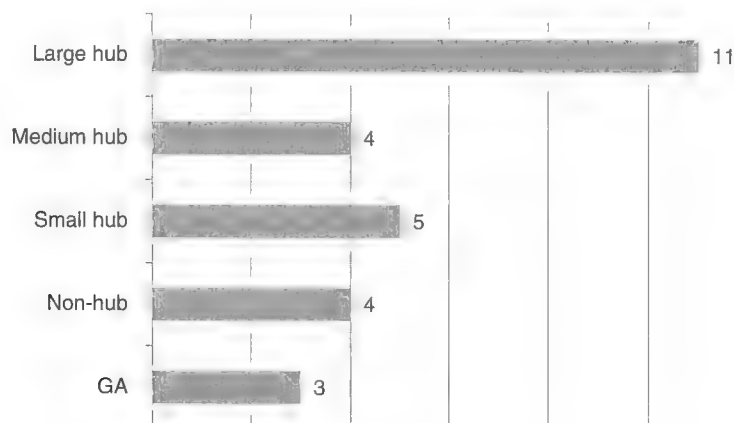
FIGURE 2 Airport respondents' self-selected hub size. Six participants did not indicate a hub size. *Note:* Large hub is defined as at least 1% of total U.S. passenger enplanements. Medium hub is defined as between 0.25% and 1% of total U.S. passenger enplanements. Small hub is defined as between 0.05% and 0.25% of total U.S. passenger enplanements. Non-hub is defined as less than 0.05%, but more than 10,000 annual passenger enplanements.
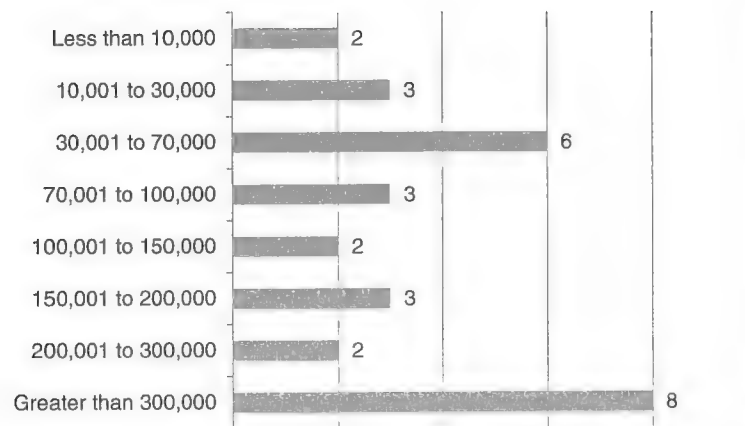
FIGURE 3 Airport respondents' self-selected number of annual operations. Four airports did not indicate annual operation.
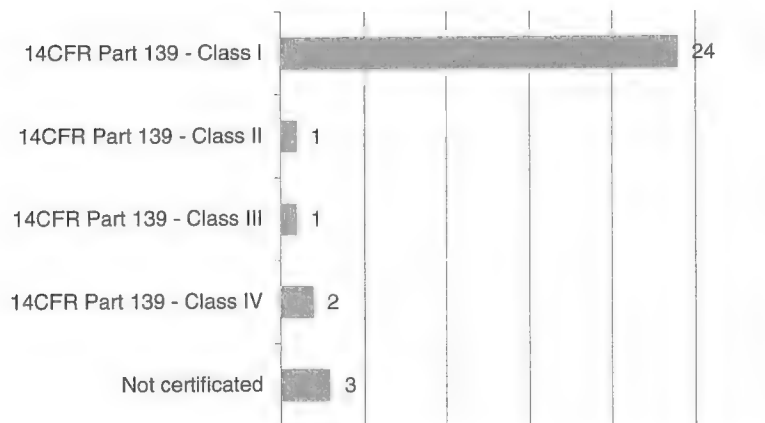
FIGURE 4 Airport respondents' self-selected FAA certification. Two airports did not indicate FAA certification.
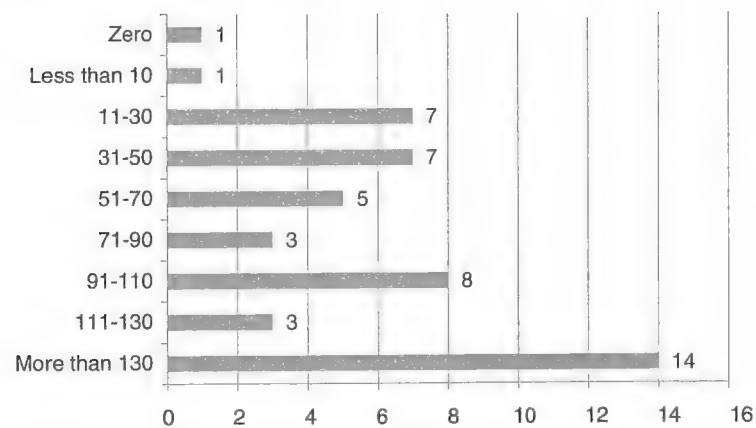
FIGURE 5 Number of airports inspected.

REPORT ORGANIZATION

This report has been organized into eight chapters. This chapter introduced the concept of an airport self-inspection program, including regulatory requirements, as well as the scope and methodology of the synthesis. Chapter two focuses on training practices that exist for those individuals who perform self-inspections, as well as specific topics such as initial training, recurrent training, outsourced training, in-house training, and typical airport training programs. Chapter three highlights the inspection process and includes types of inspections, tools used during inspections, and the personnel typically responsible for performing inspections. Additionally, chapter three presents photos of discrepancies discovered and areas to be inspected during regularly scheduled inspections. Chapter four includes information on the reporting of discrepancies, including to whom they are reported, the manner in which reports are filed, and the concept of prioritization. Chapter five addresses the follow-up, resolution, and close-out processes, including the personnel responsible for close-outs and the methods used to close out, or resolve, a discrepancy. Chapter six highlights the need for effective quality control of self-inspection programs and presents issues such as complacency, fatigue, and other human factor issues. In chapter seven the concept of oversight, at both the federal and state levels, is presented. Finally, chapter eight presents concluding thoughts and summarizes the major findings of the synthesis.

CHAPTER TWO

TRAINING

One of the first major considerations of any airport self-inspection program is the degree and type of training that will be required of all personnel responsible for conducting self-inspections. Only personnel who have met the training requirements of Part 139 can perform the FAA-required daily self-inspection (Lammerding 2010b). This requires, therefore, developing an effective training program backed up with adequate documentation. For certificated airports, this is required; for others, it is recommended. As stated in AC 150/5200-18C:

> While Part 139 requirements are mandatory for a holder of a Part 139 Airport Operating Certificate, the regulation contains many safety practices that the Federal Aviation Administration recommends for use at all airports (FAA 2004, p. 1).

PART 139.303

Section 303 of Part 139 addresses the training of personnel. This section requires every certificated airport to:

a. Provide sufficient and qualified personnel to comply with the requirements of its ACM and Part 139.
b. Equip personnel with sufficient resources needed to comply with the requirements of Part 139.
c. Train all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of its ACM and Part 139.
d. Record all training completed by each individual after June 9, 2004 in compliance with this section, including, at a minimum, a description and date of training received. Such record must be maintained for 24 consecutive calendar months after completion of training.
e. As appropriate, comply with the following training requirements of Part 139:
   i. 139.319, Aircraft rescue and firefighting: Operational requirements;
   ii. 139.321, Handling and storing of hazardous substances and materials;
   iii. 139.327, Self-inspection programs;
   iv. 139.329, Pedestrians and ground vehicles;
   v. 139.337, Wildlife hazard management; and
   vi. 139.339, Airport condition reporting.
f. Use an independent organization or designee to comply with the requirements of its ACM and Part 139 only if:
   i. Such an arrangement is authorized by the Administrator;

ii. A description of the responsibilities and duties that will be assumed by an independent organization or designee is specified in the ACM; and
iii. The independent organization or designee prepares records required under Part 139 in sufficient detail to assure the certificate holder and the Administrator of adequate compliance with the ACM and Part 139 (Certification of Airports 2004).

In providing "sufficient and qualified personnel" as required by Part 139.303(a), certificated airports are tasked with (a) employing an adequate number of personnel to carry out the duties of the ACM, and (b) ensuring that these personnel are qualified with the requisite skills, knowledge, and abilities to carry out the duties specified in the ACM. In addressing the first part of this task, airports focus not only on recruiting top-notch personnel but also on retaining these personnel. By recruiting through nationwide venues and offering competitive salaries, significant benefits, and a safe and productive work environment, airports can make significant strides in these two areas (Certification of Airports 2004).

As required by Part 139.303(b), equipping personnel sufficiently to carry out the duties specified in the ACM and the requirements of Part 139 is a significant expense for certificated airports. At a minimum, as noted in chapter three, personnel conducting self-inspections need a properly marked and lighted vehicle equipped with a two-way aeronautical radio, as well as a flashlight and a camera (Lammerding 2010a). However, Part 139 has requirements beyond the self-inspection. For instance, aircraft rescue and firefighting (ARFF) personnel require substantial financial resources in the form of equipment, agents, tools, clothing, training, and facilities in which to house personnel and equipment, with the degree of investment dictated to some extent by the airport's ARFF Index. Many airports have entered into mutual aid agreements with local municipalities to meet the ARFF Index requirements, but with minimal investment in personnel, equipment, and facilities. At the same time, many airports, especially larger airports, have found it more efficient to employ ARFF personnel and invest in equipment, training, and facilities.

With regard to an airport's self-inspection program, subpart (c) is the most important section within Part 139.303. As

mentioned, this subpart requires certificated airports to "train all personnel who access movement areas and safety areas and perform duties in compliance with the requirements of the ACM and the requirements of this part" (Certification of Airports 2004). Additionally, the subpart requires that this training be completed before the initial performance of such duties and at least once every 12 consecutive calendar months thereafter. According to Part 139.303(c) the curriculum for initial and recurrent training must include at least the following areas (Certification of Airports 2004):

- Airport familiarization, including airport marking, lighting, and signs system;
- Procedures for access to, and operation in, movement areas and safety areas, as specified under 139.329;
- Airport communications, including radio communication between the air traffic control tower and personnel, use of the common traffic advisory frequency if there is no air traffic control tower or the tower is not in operation, and procedures for reporting unsafe airport conditions;
- Duties required under the ACM and Part 139; and
- Any additional subject areas required under 139.319, 139.321, 139.327, 139.329, 139.337, and 139.339, as appropriate.

Next, Part 139.303(d) requires certificated airports to document and maintain records of all training. This was not required before the June 2004 revision of Part 139. Since the revision, certificated airports have been required not only to develop training programs but to maintain a record-keeping system as well. Although the manner in which certificated airports conduct initial and recurrent training varies, the documentation need not be complex. Table 2 presents a sample individual training record that may be used in compliance with Part 139.303. Airports may find it useful to develop a spreadsheet or database to maintain training records electronically, but in reality, compliance with the record-keeping aspect of 139.303(d) could be handled as easily using alphabetical folders in a file cabinet.

Part 139.303(e) makes it clear to the certificate holder that training is required in areas beyond conducting self-inspections. For instance, Part 139.319, Aircraft rescue and firefighting: Operational requirements, requires all rescue and firefighting personnel to be trained in the following areas:

- Airport familiarization, including airport signs, marking, and lighting;
- Aircraft familiarization;
- Rescue and firefighting personnel safety;
- Emergency communications systems in the airport, including fire alarms;
- Use of the fire hoses, nozzles, turrets, and other appliances required for compliance with Part 139;
- Application of the types of extinguishing agents required for compliance with Part 139;
- Emergency aircraft evacuation assistance;
- Firefighting operations;
- Adapting and using structural rescue and firefighting equipment for aircraft rescue and firefighting;
- Aircraft cargo hazards, including hazardous materials or dangerous goods incidents; and
- Familiarization with firefighters' duties under the airport emergency plan (Certification of Airports 2004).

Additionally, aircraft rescue and firefighting personnel must participate in at least one live fire drill before the initial performance of duties and every 12 consecutive calendar months thereafter. Further, at least one of these personnel must be trained and be current in basic emergency medical services and must be available during air carrier operations (Certification of Airports 2004).

Part 139.321, Handling and storing of hazardous substances and materials, requires training of fueling personnel in fire safety and training of personnel who receive and handle hazardous substances and materials. Part 139.329, Pedestrians and ground vehicles, requires that certificated airports ensure that personnel (including employees, tenants, and contractors) are trained in procedures required under Part 139.329(b),

TABLE 2
SAMPLE INDIVIDUAL TRAINING RECORD (139.303)

Department:	Name:												
Year:	Time Spent (Hours 0.0)												Total
Month:	J	F	M	A	M	J	J	A	S	O	N	D	
Airport Familiarization													
Movement and Safety Areas													
Airport Communications													
Duties Under the ACM													

Source: Adapted from Lammerding 2010a.

and informed of the consequences of noncompliance, before moving on foot or operating a ground vehicle in movement areas or safety areas. Part 139.337, Wildlife hazard management, requires certificated airports with a wildlife hazard management plan to develop a training program conducted by a qualified wildlife damage management biologist. According to AC 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports,* the initial and recurrent training for airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans must be at least 8 hours in length (FAA 2010). Further, Part 139.339, Airport condition reporting, requires that personnel be trained adequately to issue Notices to Airmen (NOTAMs).

According to the FAA, airports may not allow a person to, for example, perform ARFF duties or sign a daily self-inspection report if they have not received all of the training in the required subject areas. This training must be accomplished before personnel perform their duties and every 12 consecutive calendar months thereafter. If an airport allows improperly or insufficiently trained personnel to carry out tasks required by Part 139, the function that person was performing would be considered invalid. In other words, it would be the same as *not doing it at all.*

Source: Lammerding 2010b.

PART 139.327

Of the areas of training required under Part 139.303(e), the training requirements of Part 139.327 are the most important to an airport's self-inspection program. Part 139.327 sets forth regulatory requirements for certificated airports in carrying out a self-inspection program. Aside from addressing such items as the frequency of inspections, the dissemination of information to air carriers, a reporting system to ensure correction of unsafe conditions, and documentation of conditions found and corrective action taken, Part 139.327 also addresses training of personnel. Specifically, it requires certificate holders to:

1. Provide both initial and recurrent training at least every 12 consecutive calendar months in at least the following areas:
   a. Airport familiarization, including airport signs, marking and lighting;
   b. Airport emergency plan;
   c. NOTAM procedures;
   d. Procedures for pedestrians and ground vehicles in movement areas and safety areas; and
   e. Discrepancy reporting procedures.
2. Prepare records of all training given after June 9, 2004 to each individual in compliance with this section that includes, at a minimum, a description and date of training received. Such records must be maintained for 24 consecutive calendar months after completion of training (Certification of Airports 2004).

As with Part 139.303, documentation of training need not be complex (as seen in Table 3). However, certificated airports must provide training in the areas shown in Table 3, as well as in Table 2, for all self-inspection personnel. In that regard, Table 3 can be considered *additional* subject areas.

In addition to the training areas spelled out in Part 139, AC 150/5200-18C provides areas or items that airports may wish to consider. First, it is important that inspection personnel know the FAA AC standards applicable to the airport. Inspection personnel must also be taught correct radio communication phraseology, procedures, and techniques, as specified in the Aeronautical Information Manual. Additionally, inspection personnel must be aware of construction safety plans and know how to become familiar with safety plans for new and future construction projects. For certificated airports, it is important that inspection personnel be familiar

TABLE 3
SAMPLE INDIVIDUAL TRAINING RECORD (139.327)

Department:	Name:												
Year:	Time Spent (Hours 0.0)												Total
Month:	J	F	M	A	M	J	J	A	S	O	N	D	
Airport Familiarization													
Airport Emergency Plan													
NOTAM Procedures													
Pedestrians and Ground Vehicles													
Discrepancy Reporting Procedures													

Source: Adapted from Lammerding 2010a.

with the requirements of the ACM concerning training and self-inspection. Lastly, it is important that personnel become familiar with any Standard Operating Procedures, Operating Directives, Letters of Agreement, Memorandums of Understanding, and any other policies related to the certification of the airport, the operation of the airport, the ACM, and the self-inspection program (FAA 2004).

INITIAL TRAINING

Initial training of new personnel is common for most positions within the aviation industry. During initial training, personnel are indoctrinated into company policies and taught how to perform their essential duties safely. Specifically, for personnel conducting airport self-inspections, initial training provides a critical link for teaching new inspection personnel not only the duties of their position (typically operations-related) but also the proper manner in which to perform a self-inspection in support of the overall safety of the airport and Part 139 regulatory requirements.

As previously presented, although the curriculum for initial training of personnel at certificated airports responsible for carrying out the requirements of the ACM is spelled out in Part 139, specific training methods are at the discretion of each airport. Many options currently exist for airports in this regard. One common method of training self-inspection personnel is by means of on-the-job training. This method of training requires a great deal of commitment by airport personnel. Often, airports require new personnel to ride along with more senior personnel on daily self-inspections to gain firsthand knowledge of how to conduct an inspection properly and of the items specific to that airport that are to be inspected. Some airports, such as Tampa International Airport, require new operations personnel to undergo up to 6 months of on-the-job training and to complete a checkride and a written and oral knowledge test successfully before allowing them to conduct an inspection solo.

Training methods used often to supplement on-the-job training include videos, textbooks, oral and written tests, self-study, group study, simulation, and interactive training. The use of simulation in personnel training, although a relatively new concept, can add a sense of realism never before possible away from on-the-job training. Specifically for self-inspection personnel, driver simulation programs have been developed to allow the trainee to simulate driving on the airfield in both daytime and nighttime conditions while communicating with Air Traffic Control and responding to instructions. For newly hired self-inspection personnel who may be unfamiliar with operating a vehicle on the aircraft operating area (AOA) while conducting a self-inspection, gaining experience while safely inside a training room can have a positive impact. Similar to simulation programs to some degree, electronic interactive training programs are used by some airports and, although typically supplied by an off-site provider, can be integrated into an in-house training program. Although

interactive training can be web-based, many of these programs are housed on an airport's server and have touch-screen monitors that show airport-specific video clips before quizzing the trainee on the information viewed. Questions can even be selected by the computer in real-time, as the trainee answers questions correctly or incorrectly. One provider currently offers a system that can be designed to offer training in areas such as security identification display area procedures, movement area driver training procedures, and self-inspection and Part 139 procedures. Typically, airport-specific video is recorded and incorporated into the interactive training platform to provide as much realism for the trainee as possible.

RECURRENT TRAINING

Even though personnel are trained before they perform their duties, recurrent training is important to maintain proficiency. Without recurrent training, the effects of initial training gradually decline, thus negatively impacting the airport self-inspection program. Many airports have adopted a program of recurrent training for personnel in various departmental areas, and the 2004 revision of Part 139 requires recurrent training of personnel in certain areas at least once every 12 consecutive calendar months. However, an airport may find it beneficial to offer more frequent recurrent training to personnel. For instance, if a new piece of equipment, such as a friction tester, is acquired, an airport will likely need to train personnel in the proper use of that equipment.

Similar to initial training, recurrent training may be conducted through a variety of methods. Airports may use workshops, conferences, hands-on training, job shadowing, tests, videos, self-study, interactive training, and other methods. However, airports often rely more on workshops, conferences, and various off-site schools for their recurrent training needs. By providing opportunities for personnel to "dig deeper" into Part 139, personnel will advance beyond rote memorization and further develop the ability to meet the regulatory requirements in all situations.

TRAINING DESIGN

Although the design of an airport's training program will vary and is best if specific to that airport, there are certain criteria to consider in designing training. Most important, effective training is student-centered. It focuses on what students should know, be able to do, or appreciate upon conclusion of the training. In the past, the focus was on what would be taught, rather than on what students would learn. To some degree in airport training, that is still the case. For instance, airports want employees to know Part 139, specific ACs, the airport layout, security identification display area requirements, and other areas. But instead of asking what will be taught, it is effective to ask what students need to know. This focus on outcomes, rather than on content, is now the new norm. Further, as part of a student-centered approach, training will be

designed with the student in mind, considering prior knowledge and experiences, and developed to ensure a good learning experience. Rather than having airports show an old video in a darkened room, they are encouraged to develop an interactive training program with airport-specific photos, case stories, and discussions. This may involve visiting peer airports, attending industry events, and learning from FAA personnel. If airports first consider the learner, training can be designed with effective results.

"Stories from the Field"

Salt Lake City International Airport has a well-developed and comprehensive training program for self-inspection personnel. Each Operations Manager and Operations Specialist undergoes several weeks of training before assuming self-inspection duties. In training personnel on all aspects of airfield self-inspection and condition reporting, the airport training program covers all movement and non-movement areas (including taxiways, runways, and ramps), as well as perimeter security, fuel farms and equipment, ARFF, and buildings. Each Operations Manager and Operations Specialist undertakes three additional training sessions each year, covering airfield condition reporting and inspections. These sessions are in the form of either computer-based training or PowerPoint presentation.

Source: A. Stuart, Salt Lake City International Airport.

IN-HOUSE TRAINING

Whether conducting initial or recurrent training, airports may choose from one of two main options: in-house and outsourced. Depending on the airport, in-house training can be more or less expensive than outsourced training. Although developing quality in-house training requires the commitment of personnel, it may be particularly suited for airports with personnel skilled in training. In-house training may also benefit smaller airports without the resources required for outsourced training, or with such a small number of personnel that in-house training simply makes more sense financially. Two substantial benefits of in-house training are the avoidance of travel costs and minimal time away from work for the personnel being trained. For example, with no costs for airfare, lodging, or per diem, in-house training provides substantial financial savings for the airport. Additionally, the individual being trained can complete training while at work, minimizing time away from the job. In-house training also provides an opportunity to tailor training to the specific airport environment and to incorporate any special airport circumstances into the training. In-house training familiarizes the airport inspector with the "home" airport, which should translate to smoother and more thorough inspections. By conducting in-house training with airport personnel, additional cost savings can be realized. Further, by being afforded the opportunity to train personnel, the trainers will likely learn their own strengths and weaknesses, and enhance their knowledge as a result.

In-house training also has drawbacks. For example, trainees who undergo only in-house training miss the opportunity to examine how airports in other regions of the country train and perform self-inspections. Trainees may also miss out on the expertise of professional trainers. Lastly, an in-house training program requires coordination by the airport not only to train the trainer and provide training facilities, but also to schedule training and to maintain records. In sum, depending on the airport, in-house training may be more expensive and of lesser quality than outsourced training.

OUTSOURCED TRAINING

A valid alternative to in-house training is outsourced training. Both initial and recurrent training may be offered using this option. Outsourced training involves the airport contracting with an external provider to provide training, whether this training takes place at the airport or off site. This training may be specific only for that airport's personnel, or it may be offered to a group of individuals from any interested airport. Several organizations, aviation-specific or non-aviation–specific, offer training for airport personnel. Indeed, airports may contract customer service training, training in wildlife hazard management, self-inspections, and other areas of training. Several industry associations, numerous state institutions, and a number of private providers offer workshops, meetings, schools, and conferences each year. The training opportunities provided may be conducted by industry experts. Training may last from several hours, to 1 week, to an entire semester. In addition, the industry offers various certifications for airport personnel to gain credentials. For instance, airport personnel may become an Accredited Airport Executive or an International Airport Professional.

Utilizing outsourced training has many benefits. This method may allow airport personnel to come into contact with and learn from inspectors and other airport personnel from airports across the nation. This process generates ideas and methods that may prove useful to an airport. Additionally, outsourcing minimizes the burden of coordinating in-house training to ensure that an in-house trainer is available. Thus, outsourced training may be more cost-effective for an airport. However, airport operators are responsible for maintaining oversight of external providers, and are cautioned against delegating the responsibility for initial and recurrent training of personnel solely to external training providers.

Similar to in-house training, outsourced training has drawbacks. It may be more expensive to rely on outsourced training, especially if conducted off site. With lodging, transportation, and registration fees, outsourced training may be cost-prohibitive. Personnel will also require more time
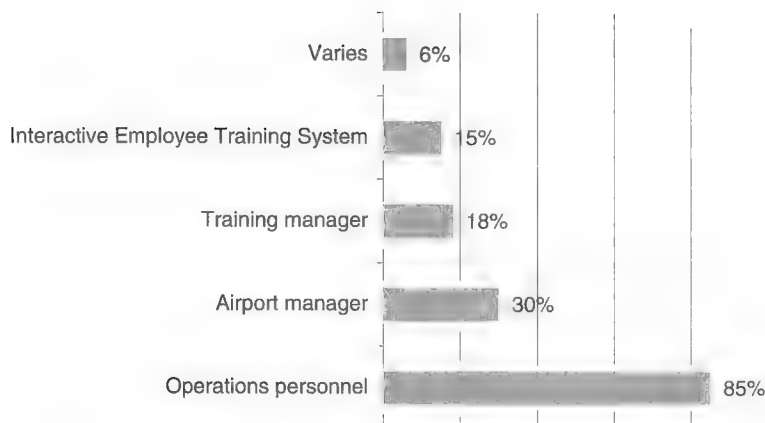
FIGURE 6 Responsibility for self-inspection training. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.

away from work while attending off-site training. Additionally, depending on the training program, outsourced training may not be as airport-specific as desired.

CURRENT AIRPORT TRAINING PRACTICES

Frequency of Self-Inspection Training

Before discussing current types of airport training methods, it is helpful to understand the frequency of self-inspection training at airports. The majority of participating airports (91%) conduct initial training as needed, when new personnel are hired. Most participating airports (72%) conduct recurrent training annually. A few of the participating airports (10%) conduct recurrent training monthly, with the remainder conducting either weekly or bimonthly recurrent training.

Responsibility for Conducting Training

When asked who conducts self-inspection training at their airport, 85% of the participants indicated their respective airport operations personnel; none of the participating GA airports

utilize operations personnel for this purpose. Other participants identified the airport manager or training manager as responsible for self-inspection training (Figure 6). The airport manager conducts training at 100% of non-hub airports and 50% of GA airports. Training is conducted by a training manager at 25% of small-hub airports and 25% of non-hub airports, but only at 18% of large-hub airports. Interactive training is relied on by 27% of large-hub airports and 25% of non-hub airports, but much less at airports of other sizes.

Duration of Training

As previously discussed, training is composed of both initial training (typically for new hires) and recurrent training (typically on an annual basis for all personnel). To determine current practices regarding training of personnel for self-inspections, participating airports were first asked about the duration of initial training for inspection personnel before these individuals are granted self-inspection authority. As seen in Figure 7, self-inspection training is most often combined with other training offered to new hires. However, open-ended responses also revealed a pattern of on-the-job training lasting from 1 to
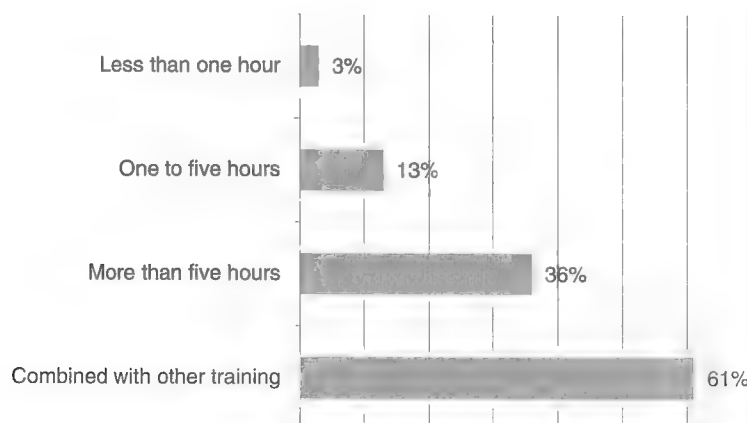
FIGURE 7 Duration of initial training. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.
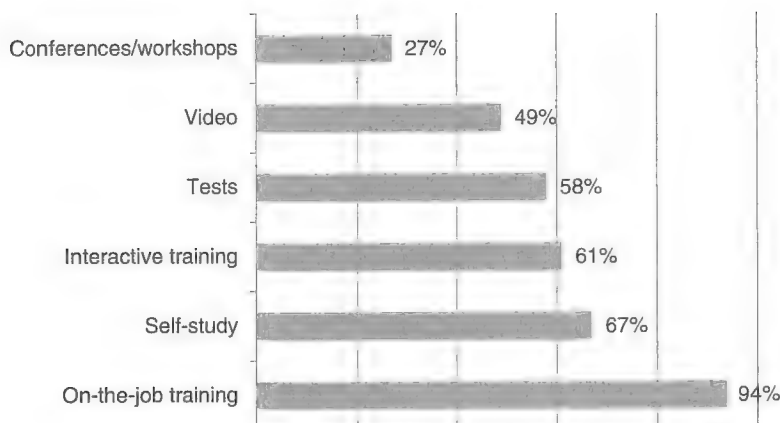
FIGURE 8 Initial training methods. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.

3 months. If training for conducting self-inspections is combined with other operational training, it may last for several months. However, if the training required to conduct self-inspection is offered in a stand-alone module, it takes significantly less time.

Training Methods

When queried about whether this initial training was conducted in-house or from a private provider, all respondents indicated they have an in-house training program. Moreover, 9% of large-hub and 17% of medium-hub airports also rely on private providers.

Airports were also queried about the methods used for initial training of inspection personnel. Although on-the-job training is the most common, airports employ a diverse set of methods for training, as seen in Figure 8. Large-hub airports tend to use on-the-job training (100%), interactive training (82%), and self-study (73%). Medium- and small-hub airports rely mostly on on-the-job training (100%). Self-study and on-the-job training are common at non-hub and GA airports, although 75% of non-hub airports also employ interactive training.

When airports were asked why they had chosen these initial training methods, several themes emerged from the responses (Appendix G). Most commonly, airports indicated their chosen methods were reliable, successful, or effective. Another common theme was that the chosen methods were low-cost. Finally, several airports indicated they prefer to vary training methods to ensure blended learning. By varying techniques and relying on a combination of training methods, personnel became more informed and more apt to learn. As one participant explained, "[Our methods] have proven reliable over a period of time, and they are implementable at a relatively low cost."

In addition to initial training of personnel, recurrent training is conducted at airports. When asked about the methods in use to train inspection personnel recurrently, the most common responses were on-the-job and interactive training. As seen in Figure 9, airports again rely on a diverse set of methods to recurrently train inspection personnel.
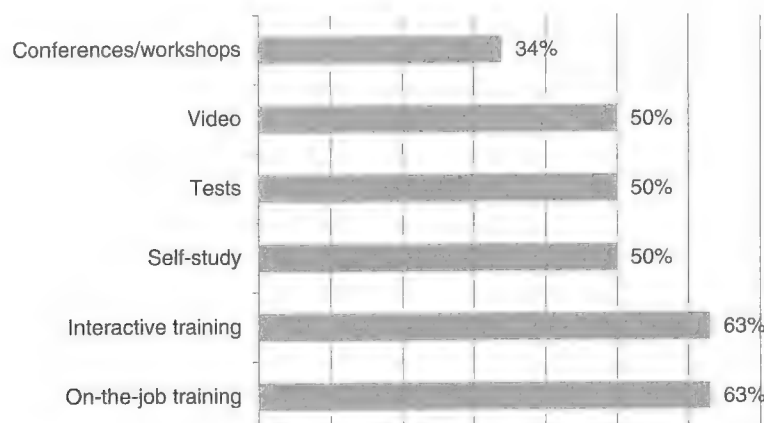
FIGURE 9 Recurrent training methods. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.
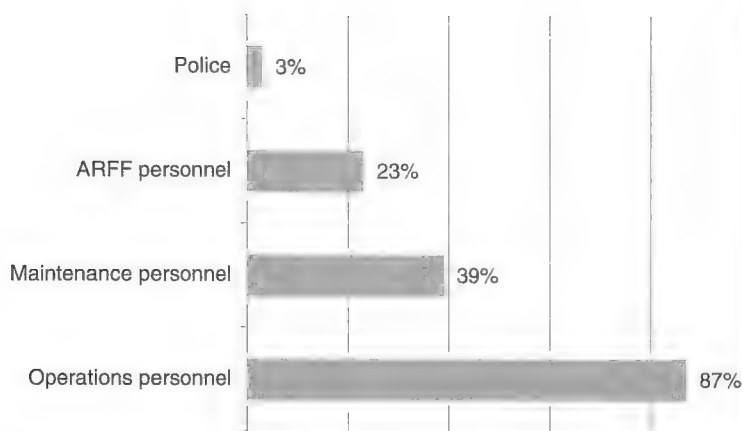
FIGURE 10 Part 139 training by employee group. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.

When analyzed by airport hub size, large-hub airports most commonly use interactive training (90%) and tests (80%). Medium-hub airports mostly rely on on-the-job training (67%). Small-hub airports tend to use a combination of self-study, on-the-job training, interactive training, and conferences or workshops, with 63% utilizing each of these. Among non-hub and GA airports, self-study and on-the-job training are most common.

When asked why these specific methods were chosen, respondents again spoke of the benefits of multiple methods (Appendix G). The most common theme identified was that the methods were reliable, effective, or successful. Other themes include a blend of methods and costs outweighing the benefits. Although only one-third of participating airports utilize conferences or workshops for recurrent training, one respondent explained why conferences or workshops are beneficial: "We feel that once the person has proven him or herself, we are comfortable with investing a little more in the employee and will send them to training or a conference off-site." Even so, it appears that a majority of airports (97%) provide recurrent training in-house, with only a small percentage of large-, medium-, and small-hub airports relying on a private provider.

Training by Employee Group

Although Part 139 indicates that training must be carried out for all personnel who access movement and safety areas and are responsible for performing duties in compliance with the ACM, airports were queried about which employee groups received all components of required Part 139 training. As

seen in Figure 10, operations personnel was the group most likely to receive the required Part 139 training. However, at some airports, other employee groups received this training as well. Interestingly, one airport stated that even though they had never provided Part 139 training to maintenance personnel in the past, "During our yearly inspection in March, our inspector requested that we train our maintenance personnel. We are currently working towards that." Indeed, if these maintenance personnel, such as airfield electricians, are accessing movement and safety areas and performing duties in compliance with the requirements of the ACM, according to FAR Part 139.303, they must receive training in the areas outlined in FAR Part 139.303. Of note, however, 71% of participating airports mention they only train personnel with regard to their specific responsibilities as identified in the airport's ACM. In other words, personnel are not necessarily being trained in all areas outlined in the ACM if they are not responsible for maintaining compliance with the entire ACM. This typically means that operations personnel are trained in all aspects of the AC, whereas ARFF and maintenance may receive training in specific areas.

Personnel Credentials

To determine whether airports require inspection personnel to pursue added credentials or certifications, airports were queried about personnel credentials. Only 34% of participating airports strongly encourage inspection personnel to obtain any of these credentials; 59% do not encourage or require personnel to obtain these credentials. Only two participating airports require any of these credentials by personnel conducting self-inspections.

CHAPTER THREE

INSPECTING

The essence of maintaining regulatory compliance with Part 139 and ensuring airfield safety is a successful airport self-inspection program. The pillar of such a program, inspecting, is the main method used by certificated airports to identify and address issues on the airfield that must be resolved to ensure regulatory compliance with Part 139. As stated by the FAA, "at airports certificated under Part 139, the self-inspection program is a key component of an airport operator's airport certification program and required under Part 139.327" (FAA 2004, p. 2). According to one FAA inspector, "Even more than documentation, the airport's condition leads to the most discrepancies" (Lammerding 2010b). Even so, the inspector notes, "Most of these items can be avoided through basic preventative maintenance schedules and proper self-inspection procedures" (Lammerding 2010b). Truly, even among non-certificated airports, regular self-inspections are integral to maintaining airfield safety and ensuring compliance with standards.

INSPECTION PERSONNEL

The foundation for a successful airport self-inspection program lies in the personnel tasked with conducting self-inspections. Whether these personnel include the airport manager or ARFF, operations, or maintenance personnel, specific considerations are necessary. As discussed in chapter two, certificated airports are required to (1) provide sufficient and qualified personnel, (2) equip these personnel, (3) train these personnel, and (4) maintain personnel training records (Certification of Airports 2004). Once personnel are hired, trained, and equipped, they engage in the daily task of conducting inspections. Although an airport may ask properly trained air carrier and fixed-base operator personnel to assist in certain aspects of the inspection, airports are cautioned by the FAA that "at Part 139 airports, the FAA will hold the certificate holder ultimately responsible for operating the airport safely" (FAA 2004, p. 3).

FREQUENCIES OF INSPECTION

The manner by which self-inspections are conducted varies among airports. However, according to AC 150/5200-18C, it is important that all airport self-inspection programs incorporate inspections according to the four main types of frequencies. First, *regularly scheduled inspections* would be conducted at least daily during both daytime and nighttime hours. These inspections would occur at least daily during a time when aircraft traffic is minimal in order to lessen any disruption to airport operations. Second, *continuous surveillance inspections* are conducted in areas and facilities that have been identified as being susceptible to hazardous conditions. By maintaining a constant awareness of specific areas and facilities that are prone to hazards, the incidence of hazards can be reduced. Third, *periodic condition inspections* are conducted on a regularly scheduled basis, but less frequently than daily. Periodic condition inspections are similar to daily inspections, but focus on areas and facilities that may not need to be attended to daily. Depending on the area or facility, these inspections may be conducted monthly, weekly, or quarterly. Fourth, *special inspections* are conducted after the receipt of a complaint or when an unusual event or condition occurs, such as a significant meteorological event, or an accident or incident. Additionally, special inspections would also be conducted at the end of a construction project. These are to be completed before construction personnel leave the airport, in case corrective measures need to be taken by the contractor. Airports may have specific checklists for each type of inspection or may incorporate each type of inspection into the daily self-inspection checklist. Regardless, all inspections are to be appropriately documented (FAA 2004).

AC 150/5200-18C offers additional guidance on the areas that should be inspected during each of these four inspection frequencies. As shown in Table 4, there are recommended areas of inspection based on the four main types of inspection frequency. Although some areas are shown in more than one inspection frequency each area is fully discussed.

SELF-INSPECTION TOOLS

Airports have a wide array of tools to assist personnel in conducting self-inspections. These tools can assist either with (1) conducting the actual inspection or (2) with recording findings, whether on a checklist or otherwise. Although tools are also available to assist personnel with reporting discrepancies and findings; follow-up, resolution, and close-out; as well as with quality control and training, tools for these tasks are presented in their respective chapters. In essence, discrepancies are first noted and recorded, which is the subject of this chapter.

For conducting the actual inspection, a basic tool that should be utilized by all certificated airports, according to the FAA, is a vehicle that is equipped with:

TABLE 4
RECOMMENDED AREAS OF INSPECTION ACCORDING TO THE TYPE OF INSPECTION

Regularly Scheduled Inspection		
Pavement areas	Navigational aids	Construction
Safety areas	Obstructions	Aircraft rescue and firefighting
Markings	Fueling operations	Public protection
Signs	Snow and ice	Wildlife hazard management
Lighting		
Continuous Surveillance Inspection		
Ground vehicles	Construction	Wildlife hazard management
Fueling operations	Public protection	Foreign object debris
Snow and ice		
Periodic Condition Inspection		
Pavement areas	Quarterly fueling inspections	Obstructions
Markings	Navigational aids	Aircraft rescue and firefighting
Signs	Lighting	
Special Condition Inspection		
Pavement areas	Safety areas	Construction
Markings and signs	Snow and ice	Surface movement guidance and control system

Source: FAA 2004. Refer to Appendix N for an excerpt from this AC.

- A two-way ground control radio capable of communicating with the Airport Traffic Control Tower (ATCT) on controlled airports and on the Common Traffic Advisory Frequency (CTAF) or Universal Communications at uncontrolled airports;
- A beacon for nighttime (or inclement weather conditions) inspections; and
- Either a beacon or checkered flag for daytime inspections (FAA 2004, p. 4).

Figure 11 shows a vehicle utilized by airport operations personnel at Salt Lake City International Airport to conduct self-inspections.

FIGURE 11 Operations vehicle. *Source:* A. Stuart, Salt Lake City International Airport.

It is important that inspection personnel be equipped with other tools necessary to inspect the areas noted in AC 150/5200-18C. Although knowledge of the areas outlined within the AC is necessary for inspection personnel, the wildlife area is typically the only area that requires additional tools. These may include a gun with live ammunition or scare munitions, binoculars, shovel, bucket, trash bags, gloves, earplugs, and impact-resistant glasses or goggles. Airports with well-developed wildlife hazard management programs may require additional tools.

To assist personnel with recording findings, the first and most important tool is the self-inspection checklist. Although checklists also aid personnel in conducting the actual inspection, especially with minimizing complacency, once completed, they provide an historical record of findings during each self-inspection. Typically, a checklist contains the areas of inspection required by Part 139, subpart (d)—Operations, and with the guidance contained within AC 150/5200-18C. The formats of these checklists vary by airport, and the FAA includes several formats in AC 150/5200-18C for reference. Appendices I and J contain sample self-inspection checklists in use by St. Cloud Regional Airport and Dane County Regional Airport, respectively.

Another tool that is considered fairly basic for conducting a self-inspection is a camera. Some airports find a camera beneficial for inspection personnel in documenting various airfield discrepancies or events. With a digital camera, images of issues can be attached to an electronic self-inspection checklist and e-mailed to maintenance personnel for resolution.

Particularly with regard to documenting self-inspection findings, technology has been adapted to benefit airports. Today, various computer or web-based applications can be used by self-inspection personnel in:

- Documenting self-inspection findings on a checklist;
- Recording significant operational activities in a chronological event log;
- Displaying locations of significant operational activities or discrepancies on an electronic airport diagram;
- Transmitting information to airport staff, air carriers, and FAA, as appropriate;
- Remotely reporting with mobile data computers in field vehicles; and
- Integrating geographic information system (GIS) technology.

Depending on airport needs and provider capabilities, the availability of platforms appropriate to these applications will vary. First, the application may be accessed on a standard office computer. This platform requires inspection personnel to return to the office to document findings and file self-inspection reports. Next, the application may be accessed by means of a vehicle-mounted laptop or tablet PC, with touch-screen features as an option. As shown in Figure 12,

FIGURE 12 In-vehicle mounted device. *Source:* A. Stuart, Salt Lake City International Airport.

this option adds a level of convenience previously unknown to inspection personnel. With such electronic resources available to inspection personnel, access to self-inspection forms, to the airport's work order system, and even to the ACs is substantially improved. Third, inspection personnel may be equipped with smartphones, PDAs, or other mobile devices. Accessing the airport's applications by means of these devices further enhances convenience. However, the viewing area of many of these mobile devices is quite limited, and the keyboard is often reduced to thumb manipulation; as such, personnel may find it difficult to complete self-inspection forms and interface with the airport's work order system using such devices. Often, a PDA supplements a vehicle-mounted device to fully enable inspection personnel to access the airport's applications whether on the field or in the terminal. Additionally, whether in the form of a stationary office computer, a vehicle-mounted computer, or a PDA, some applications provide the user with the capability of generating a work order, allowing for the resolution process to begin almost immediately after a discrepancy has been discovered. Whether the application allows inspection personnel to interface directly with the airport's work order system or to generate a work order to be e-mailed to maintenance, the benefits are obvious. Applications may also offer capabilities for accident reporting, NOTAM issuance, and wildlife reporting. Overall, these systems can improve a self-inspection program by enhancing efficiency and reducing workload. At the same time, however, such technology is not without added costs and, as such, is best considered on a case-by-case basis.

Based on airport survey data, the vehicle-mounted device is the most common technology-based self-inspection tool used at airports. Although these platforms are available through several providers or may even be developed in-house, they operate in a typical fashion. The computer is mounted in the inspection vehicle and, either with a touch screen or with a monitor with keyboard, may be used by inspection personnel in conducting inspections and documenting findings. By incorporating an electronic, static airport diagram, inspection personnel also are better able to document findings. Further, by having access to the self-inspection checklist on a monitor in the vehicle, airports may guard against complacency among self-inspection personnel (discussed in greater detail in chapter six). Some systems incorporate Global Positioning System (GPS) technology and present a GIS-based, moving-map airport diagram. GIS refers to a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information (Geographic Information Systems 2007). By incorporating GIS, inspection personnel can more precisely document the location of findings. By pinpointing the exact location of a discrepancy using GPS coordinates, maintenance personnel are better able to locate the discrepancy for resolution. GPS-based systems also support quality control of the self-inspection program through management oversight, as they allow the ability to replay the inspection route driven by inspection personnel.

CONDUCTING THE INSPECTION

Inspection Techniques

As stated in chapter one, there are numerous ways in which to conduct a self-inspection. These techniques vary among airports and often among personnel at the same airport. Even so, there are some commonly recognized techniques. For instance, before starting an inspection, it is beneficial for inspection personnel to review the most recently completed self-inspection checklists and any outstanding NOTAMs. By doing so, inspection personnel can stay up-to-date on airport conditions from shift to shift. If construction is in progress, it is important that inspection personnel be familiar with the current construction safety plan specific to that project, as well as any current construction issues, including escort requests, FOD control, and others (AC 5370-2E, *Operational Safety on Airports During Construction*, provides guidance in this area). Inspection personnel need to be prepared to use correct communication phraseology, procedures, and techniques as specified in the Aeronautical Information Manual (FAA, 2004).

Regarding the actual techniques to use in conducting the self-inspection, the FAA provides guidance in AC 150/5200-18C. First, the AC recommends that inspection personnel vary the pattern of the inspection. Although fixed inspection patterns may be easy to learn and provide some standardization, they often do not allow for an adequate inspection. In addition, using a fixed inspection pattern can lead to complacency, with items deserving attention possibly being overlooked. Second, the AC recommends that inspection personnel drive toward the direction of landing aircraft with high-intensity flashing beacon and headlights on, day and night. Although some airports conduct multiple passes during a runway inspection and the FAA actually recommends that a runway inspection be performed in both directions, if time only permits one pass, it is best to drive toward the direction of landing aircraft. By adopting this technique, self-inspection personnel will be able to see approaching aircraft and improve visibility of the vehicle to pilots. Third, inspection personnel need to drive the stub taxiways between the runways and parallel taxiways. Overlooking these areas may, for instance, allow FOD to remain on the pavement and be a danger to aircraft immediately before takeoff.

Mechanics of the Regularly Scheduled Inspection

As previously discussed, there are four types or frequencies of inspection. Of these, the regularly scheduled inspection is performed most often. During this inspection, personnel are tasked with observing a number of areas and facilities at the airport, which are spelled out in AC 150/5200-18C (as well as in Appendix N of this report). It is essential for inspection personnel to document each inspection as well as any findings. According to the FAA, "if you don't document it, it didn't happen" (Lammerding 2010b).

First, pavement areas are inspected, with attention to the following items:

- Pavement lips;
- Cracks;
- Holes;
- Spalling, low spots, debris (FOD), and contaminants;
- Vegetation growth; and
- Drainage and ponding.

Specifically, any issue is a concern that could cause loss of aircraft directional control or could generate FOD that may damage an aircraft or personnel. For instance, Figure 13 shows pavement deterioration that is a concern, requiring personnel to detect, report, and ensure that it does not worsen before being repaired. Figure 14 shows a buildup of rubber contaminating the runway surface. This finding may encourage airport personnel to conduct friction testing on the runway or schedule rubber removal operations.

Next, personnel need to inspect safety areas. This requires inspection personnel not only to know the dimensions of the
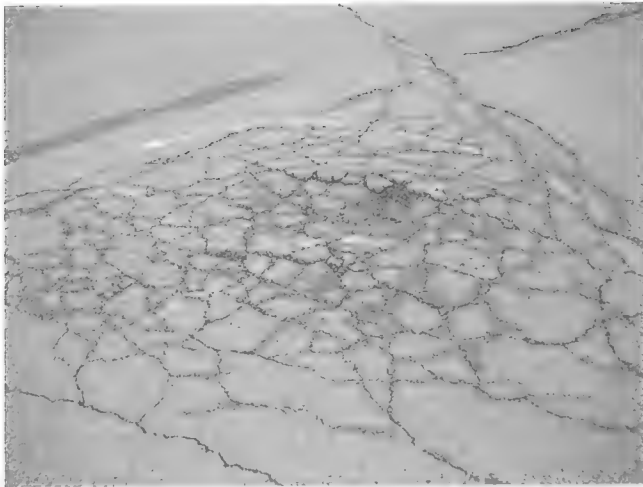
FIGURE 13 Pavement deterioration. *Source:* Lammerding 2010a.

FIGURE 15 Safety area rut and exposed concrete base. *Source:* Lammerding 2010a.

runway and taxiway safety areas at the airport, but to inspect these areas as well. Often, as several FAA lead certification inspectors suggest, this can be done adequately only by getting out of the vehicle and periodically walking the safety areas. In so doing, it is important that the following items be considered:

- Are proper dimensions maintained?
- Are there hazardous ruts and surface variations?
- Is there proper drainage?
- Are objects in the safety areas functionally necessary and on a frangible mount?
- Are equipment bases and lighting mounts at grade level?
- Are manhole and handhole covers at grade level? and
- Are the safety areas capable of supporting vehicles and aircraft (FAA 2004)?

Specifically, safety areas must be capable of supporting vehicles and aircraft without causing damage to either (FAA 2004). This becomes important if an aircraft overruns a runway or has an excursion from a taxiway, for instance. Uneven

ground with ruts and humps can shear aircraft landing gear, or worse. Figure 15 shows a rut with an exposed concrete base located in a safety area. Figure 16 shows a manhole cover that greatly exceeds the Part 139 requirements.

Markings are also essential at an airport and play a key role in providing directional guidance and information to pilots. The following items need to be considered when inspecting markings:

- Condition of the markings (correct color, paint chipping, fading, or obscure);
- Visibility of runway hold position markings;
- Reflectivity of markings at night;
- Standardization of markings; and
- Marking installation and configuration.

The FAA recommends (in AC 150/5200-18C) that airport markings comply with AC 150/5340-1, *Standards for Airport Markings,* to avoid confusion and disorientation among pilots. It can be noted that compliance with this AC is mandatory for

FIGURE 14 Contaminated runway. *Source:* Lammerding 2010a.

FIGURE 16 Safety area manhole above grade. *Source:* Lammerding 2010b.
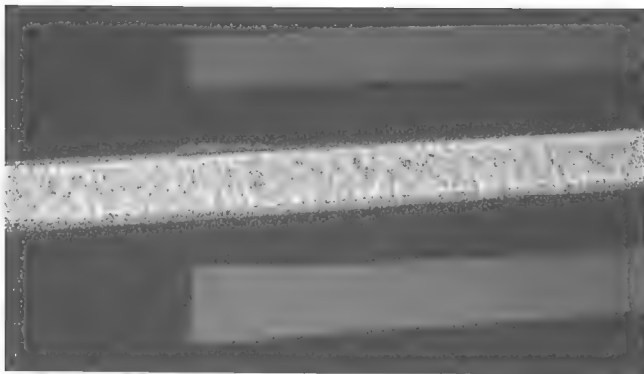
FIGURE 17 Marking reflectivity. *Source:* Lammerding 2010b.

FIGURE 19 Newly painted markings. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

certificated airports, as well as for non-certificated airports that have accepted federal funds for runway and taxiway construction or rehabilitation. Figure 17 shows the difference between two sets of markings, one with adequate reflectivity, and one without. If an airport does not conduct an inspection during hours of darkness, an item such as this will likely never be discovered and corrected. Figure 18 shows incorrect marking precedence. AC 150/5340-1 goes into great detail about precedence of markings to avoid situations such as this. It is necessary that inspection personnel also inspect newly painted markings (Figure 19).

In addition to markings, signs are integral to providing important directional and distance information to pilots and to vehicle operators at the airport. To ensure that appropriate sign standards are being met and maintained at the airport, inspection personnel need to be familiar with the airport's FAA-approved sign plan and regularly check that the airport's signs are:

- Easy to read, correct color, and retro-reflective;
- Properly illuminated and not obscured by vegetation, dirt, snow, or other obstructions;
- Frangibly mounted with concrete bases at grade level;

- On panels that are in proper condition; and
- Configured in accordance with the standards and sign plan (FAA 2004).

The FAA has developed AC 150/5340-18, *Standards for Airport Sign Systems,* to provide guidance to airports in meeting standards with their signage. It can be noted that for certificated airports, as well as non-certificated airports that have accepted federal funds for runway and taxiway construction or rehabilitation, compliance with this AC is mandatory. Figure 20 shows a sign partially obscured by vegetation. Discovering this would likely prompt inspection personnel to contact maintenance to either cut the grass with a mower or use a weed trimmer around the sign. To prevent more frequent mowing, airports may spray herbicide around the signs. However, caution is urged with this approach, because without vegetation holding onto soil, erosion around the sign

FIGURE 18 Incorrect marking precedence. *Source:* Lammerding 2010b.

FIGURE 20 Sign obscured by vegetation. *Source:* Lammerding 2010a.

FIGURE 21 Reversed signage. *Source:* Lammerding 2010b.

base may occur, thus creating another problem with a sign base not at grade level. Some airports have opted for a permanent solution to this problem by installing an artificial turf in their movement areas. For instance, in 2007 John F. Kennedy International Airport installed 90,000 sq ft of artificial turf in runway safety areas to control erosion and FOD (Nelson 2008).

Figure 21 shows a sign reversed from the standard configuration. This may be addressed by moving the sign panels or by installing a new sign according to FAA requirements. When replacing sign panels, it is best to replace both panels on a sign face at the same time. Otherwise, the new panel may overshadow the older, faded panel (Figure 22). Signage designed to remind drivers of FOD is shown in Figure 23.

Especially important to pilots at night, airfield lighting must also be inspected during a self-inspection. Although the inspection is typically concentrated on lighting owned by the airport, inspection personnel may wish to consider any lighting owned or operated by others. Although a lighting inspection may be attempted during the day, it is quite difficult to accomplish. Therefore, according to the FAA, "Inspection of lighting is best accomplished during periods of darkness in order to evaluate lighting systems when they provide the primary visual aid for pilots" (FAA 2004, p. 7). Specifically, the following lighting systems are to be inspected:

- Runway and taxiway edge lights;
- Apron edge lights;
- Runway centerline and touchdown zone lights;

FIGURE 22 Faded sign panel. *Source:* Lammerding 2009.

FIGURE 23 FOD signage. *Source:* T. Bartlett, Houston Airport System.

- Taxiway centerline lights or centerline reflectors;
- Runway threshold and end lights;
- Runway guard lights (both elevated and in-pavement, if installed);
- Ramp lights and floodlights used in construction to ensure they are properly shielded;
- Obstruction lights; and
- Lighting in fuel storage areas (FAA 2004).

Specifically, while observing these lighting systems, inspection personnel should pay attention to the intensity, alignment, color, and proper function of lighting through manual or radio control features. Figure 24 shows a taxiway edge light that is bent at the frangible base. This needs to be

FIGURE 24 Bent taxiway edge light. *Source:* P. Khera, Alaska DOT.

corrected to ensure it does not fall completely off the base and become FOD.

Navigational Aids (NAVAIDs) also should be inspected during a regularly scheduled inspection. Although the inspection might focus on those visual NAVAIDs owned by the airport operator, inspection personnel are advised to also observe any NAVAIDs owned or operated by others, such as the FAA (FAA 2004). Items to be observed include:

- Segmented circle;
- Rotating beacon;
- Wind cone(s);
- Runway end lights;
- Visual glide slope indicators (such as VASIs, PAPIs, or PLASIs); and
- Approach lighting (FAA 2004).

When inspecting these NAVAIDs, it is important that inspection personnel ensure that lighting is operable, NAVAIDs are not obscured by vegetation or other obstructions, frangible couplings are in good condition, and lights flash in proper sequence, as appropriate. Any outages or deficiencies of FAA equipment must be reported and documented (FAA 2004). Figure 25 shows a wind sock and Precision Approach Path Indicators in operation.

While conducting a self-inspection, personnel also need to check visually for obstructions on and near the airport. This includes checking for trees or other obstructions to Part 77 surfaces. To accomplish this, inspection personnel must be knowledgeable of Part 77 and the imaginary surfaces as they relate to the airport (FAA 2004). Specifically, the following items are to be addressed:

- Construction equipment and tall cranes in relation to Part 77; and

- Proper marking and lighting of obstructions (FAA 2004).

If construction equipment, such as a crane, is found and thought to be an obstruction, the airport operator should verify that proper notification to the FAA has been provided. If an obstruction is not properly marked and lighted, it is important that this be reported to the responsible party. In sum, inspection personnel both report and monitor any obstruction light that is missing, inoperative, or damaged, as well as any object that appears to be an obstruction and is not properly marked or lighted (FAA 2004). Figure 26 shows an obstruction as part of a construction project. In this case, a NOTAM is in place and the crane, only in operation during daylight hours, is marked with a flag.

It is important that fueling operations at the airport also be inspected during a regularly scheduled inspection. This daily inspection is necessary even though a more in-depth fueling inspection is typically conducted quarterly. Although the inspection mainly consists of a quick inspection for the most common problems concerning compliance with local fire safety codes at the airport's fuel storage areas and mobile fuelers, inspection personnel also must consider security, fire

FIGURE 25 Wind sock and Precision Approach Path Indicators in operation. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

FIGURE 26 Obstruction. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

protection, general housekeeping, and fuel dispensing facilities and procedures (FAA 2004). Items of consideration include:

- Practices of personnel conducting fueling; and
- Appropriate signage in place at the fuel farm, with gates locked as appropriate (FAA 2004).

Specifically, it is important that inspection personnel keep an eye out for unsafe fueling practices and any violation of fire codes. For instance, if fueling personnel fail to bond an aircraft with the mobile fueler or if someone smokes while fueling aircraft, inspection personnel need to take action (FAA 2004). Figure 27 shows a mobile fueler inspection in progress.

During periods of winter operations, it is important that inspection personnel observe any snow and ice and their effects. By being familiar with the airport's snow and ice removal procedures and, in the case of certificated airports, the FAA-approved Snow and Ice Control Plan, inspection personnel can effectively observe these conditions (FAA 2004). Items to be inspected include:

- Lights and signs obscured by snow or damaged by snow removal operations;
- Snow banks and drifts adjacent to runways and taxiways to ensure clearance for aircraft wing tips, engines, and propellers;
- Piles of snow to ensure that snow is not piled across the runway threshold or across from the runway or runway intersections;
- FOD from snow removal operations;
- Taxiways or access routes dedicated for ARFF to ensure they are not blocked;
- Critical areas for electronic NAVAIDs to ensure that snow has not accumulated; and
- Slippery pavement conditions (with braking action or Mu values, as appropriate) (FAA 2004).

In essence, inspection personnel inspect the AOA for unsafe conditions caused by snow and ice or the removal of snow and ice (FAA 2004). Several documents provide essential reading in this area, including AC 150/5200-30, *Airport Winter Safety and Operations.* Figure 28 shows a snowplow broken during snow removal.

Often, airports undergo construction on the airfield. In such times, inspection personnel inspect construction sites during a regularly scheduled inspection. Being familiar with the airport's construction safety plan and the guidance of AC 150/5370-2, *Operational Safety on Airports During Construction,* will benefit inspection personnel (FAA 2004). Items to be inspected include:

- Construction staging areas and stockpiled materials, to ensure that materials are properly stored and secured and are not left in safety or movement areas;
- Proper marking and lighting of construction areas and equipment adjacent to movement areas or as specified in the airport's plan;
- Construction barricades, to properly define the limits of construction and hazardous areas;
- FOD generated by construction activities;
- Open trenches in safety areas or adjacent to movement areas;
- Airfield lighting and signage adjacent to construction areas;
- Proper marking and lighting of closed pavement; and
- NOTAMs (FAA 2004).

Construction activity on the AOA is common, and by inspecting the items in the previous list, inspection personnel can ensure that this activity remains compatible with airport operations. In essence, inspection personnel report and monitor any unsafe condition created by construction activity, including damage to signs, lights, markings, and NAVAIDs. Further-

FIGURE 27 Mobile fueler inspection. Used with permission.

FIGURE 28 Broken snowplow. Used with permission.

FIGURE 29 Airfield construction project. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

more, inspection personnel need to ensure that equipment and supplies (even in the form of FOD) are not left in movement and safety areas, unless that area is closed to aircraft operations. By regularly coordinating with contractor personnel and ensuring they understand the airport's construction safety plan, many of these items can be prevented at the outset (FAA 2004). Figures 29 and 30 show an airfield construction under way.

"Stories from the Field"

The Houston Airport System, which includes George Bush Intercontinental Airport, William P. Hobby Airport, and Ellington Airport, has a well-developed construction safety

FIGURE 30 Airfield construction project. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

program. Before the start of any construction activity, the airport hosts a preconstruction kick-off meeting. At this meeting, a construction safety plan developed for that specific project is discussed in detail. Items of discussion include:

- Construction haul route;
- Site cleanliness;
- Fencing;
- FOD and the requirement for a FOD sweeper; and
- FOD checkpoint.

Additionally, the contractor is informed that the role of airport operations personnel during the project is that of coordination and liaison, in essence, the oversight of field activity. Typically, airport operations personnel are heavily involved in closing and opening pavement, issuing NOTAMs, and coordinating any necessary escorts. Airport operations personnel conduct a special inspection before opening or reopening a runway or taxiway affected by construction. Once the project is under way, daily project coordination meetings are held with both contractor and airport personnel present. Additionally, weekly or biweekly project status meetings take place. With a comprehensive construction safety plan, daily coordination, and oversight by airport operations personnel, the Houston Airport System is able to ensure a safe construction project compatible with the operation of the airport.

Source: Bartlett 2007.

Regularly scheduled self-inspection provides an opportunity for self-inspection personnel to communicate with ARFF crews to make certain that personnel and equipment are prepared for the day's activities. Items to be inspected include:

- ARFF status, including availability of equipment, firefighting personnel, and extinguishing agent (proper Index for certificated airports);
- Alarm and emergency notification systems; and
- ARFF response routes, especially if maintenance or construction activity is affecting normal routes (FAA 2004).

In conducting an inspection of the airport's ARFF capabilities, inspection personnel would report and monitor any ARFF vehicle, equipment, or extinguishing agent that is not available or is inoperative. Additionally, any reductions in ARFF personnel should be monitored. Further, if there are any changes to aircraft serving the airport, the ARFF Index may change, thus likely requiring changes in personnel, equipment, and extinguishing agent. At certificated airports, the FAA must be notified if an ARFF vehicle is inoperative and cannot be replaced immediately. Also, a NOTAM must be issued regarding the non-availability of any ARFF capability, as specified in Part 139.339 (FAA 2004; Certification of Airports 2004). Figure 31 shows an ARFF vehicle having a tire replaced, during

FIGURE 31 ARFF truck in disrepair. Used with permission.

FIGURE 33 Blast fence. *Source:* F. Dettmann, A.A.E., Hillsborough County Aviation Authority, Tampa International Airport.

which time the vehicle is unavailable. Figure 32 shows an ARFF truck in normal operating condition.

During each regularly scheduled inspection, protection of the public is also an important area of concern. For instance, gates, fencing, locks, and other safeguards need to be functioning properly to prevent inadvertent entry to movement areas by unauthorized persons and vehicles. Blast fences and other devices must be in place to offer protection from jet blast. Any of these safeguards that are damaged or missing must be noted and reported to appropriate personnel for correction (FAA 2004). Figure 33 shows a blast fence to be inspected. Figure 34 shows a downed perimeter fence that needs prompt attention.

The final category of inspection concerns wildlife. Although some airports may conduct separate wildlife hazard inspections, the FAA recommends that this area also be part of a regularly scheduled inspection. During the inspection, personnel are to be observant of large flocks of birds and evidence of birds or animals on pavement areas (Figure 35 and Figure 36).

FIGURE 34 Downed fencing. Used with permission.

FIGURE 32 ARFF truck. Used with permission.
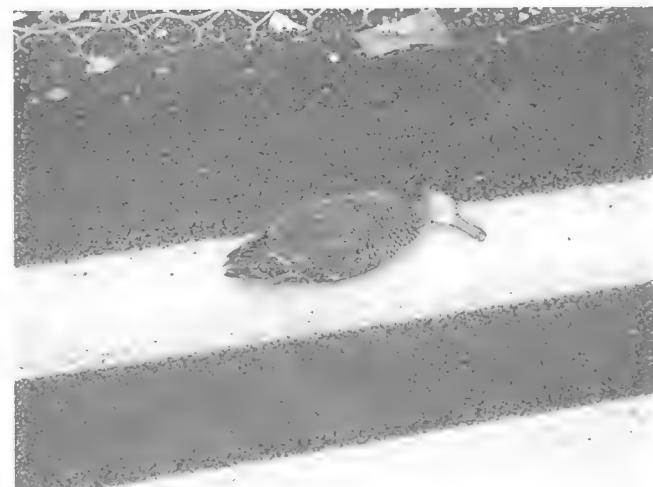
FIGURE 35 Wildlife remains discovered on paved surface. *Source:* P. Khera, Alaska DOT.

FIGURE 36 Wildlife on the airfield. Used with permission.

Personnel are to note changes in the type or quantity of wildlife and take time to check fencing and gates for wildlife accessibility. If the airport has an accepted wildlife hazard management plan, personnel need to be prepared to use the outlined mitigation measures (FAA 2004).

"Stories from the Field"

At Salt Lake City International Airport, the airfield is staffed 24 hours each day by operations personnel who continuously patrol the taxiways and monitor the runways. Runways are inspected twice each day (once during daylight and once at night), with one of the airport's three runways undergoing a more thorough inspection each day (to include safety areas). Inspection personnel utilize the airport's self-inspection checklist to guide them during the process. Night inspections cover all airport lighting, including a check of the approach lighting system (ALS). Vehicles used by self-inspection personnel are equipped with laptop computers to access and file the checklist (Figure 12). The vehicles are equipped with high-intensity lights to enable inspections to be completed during low-light or low-visibility conditions.

Source: A. Stuart, Salt Lake City International Airport.

INSPECTION RECORDS

Although required at certificated airports, it is good practice for any airport with a self-inspection program to practice good record keeping. In addition to maintaining training records (discussed in chapter two), certificated airports are required to:

Prepare, and maintain for at least 12 consecutive calendar months, a record of each inspection prescribed by this section, showing the conditions found and all corrective actions taken (Certification of Airports 2004, p. 24).

In essence, any inspection that is conducted, whether a daily inspection or a special inspection, is to be documented (see Figure 37). In addition to maintaining self-inspection records for the purpose of meeting FAA requirements, airport management may find these records useful. An analysis of past, completed self-inspection checklists may reveal certain trends, define problem areas, and provide justification for certain expenses (such as a friction tester or FOD detection technology). In addition to maintaining records of each inspection, airports may maintain copies of previous work orders, NOTAMs, and wildlife reports (FAA 2004; Lammerding 2009).

CURRENT AIRPORT INSPECTION PRACTICES

Inspection Responsibility

To determine if different personnel are responsible for conducting self-inspections and maintaining Part 139 compliance, airports were queried about the personnel responsible for these two tasks. The majority of participating airports indicated that operations personnel are responsible for conducting self-inspections (94%), as well as for maintaining Part 139 compliance (97%). When queried as to which personnel are responsible for the specific areas detailed in Part 139, the results were fairly uniform. As shown in Table 5, it is most common for operations personnel to be responsible for inspecting all areas. Next to the most common is for maintenance personnel to inspect these areas. Only in the area of fueling operations and public protection is it common to find personnel other than operations or maintenance conducting the inspections. Specifically, fixed-base operator personnel inspect fueling operations at 31% of the airports, whereas security personnel inspect areas of public protection at 34% of the airports.

Self-Inspection Methods

Airports were also queried as to the methods they use for conducting self-inspections. As seen in Figure 38, the methods in

FIGURE 37 Documentation of special inspection. *Source:* Lammerding, 2010a.

TABLE 5
INSPECTION RESPONSIBILITY BY AREA

	1st	2nd
Pavement areas	Operations (97%)	Maintenance (41%)
Safety areas	Operations (97%)	Maintenance (31%)
Markings and signs	Operations (97%)	Maintenance (38%)
Lighting	Operations (97%)	Maintenance (39%)
ARFF	Operations (89%)	Maintenance (11%)
Fueling operations	Operations (83%)	FBO (31%)
Navigational aids	Operations (97%)	Maintenance (22%)
Ground vehicles	Operations (94%)	Maintenance (29%)
Obstructions	Operations (97%)	Maintenance (25%)
Public protection	Operations (97%)	Security (34%)
Wildlife hazard management	Operations (97%)	Maintenance (28%)
Construction	Operations (97%)	Maintenance (28%)
Snow and ice control	Operations (97%)	Maintenance (38%)

Note: Participants were able to select all that apply; thus, percentages do not total 100% across categories.

use are quite diverse. It appears that the majority of airports conduct inspections with a vehicle, driven by one person, using visual cues. However, FOD walks and conducting inspections with a team are also quite common. When analyzed by hub size, using teams was most common among large-hub (73%) and small-hub (63%) airports. Generally, medium-hub (16%), non-hub (25%), and GA (0%) airports do not use teams for conducting self-inspections.

When asked to share the reasons why various inspection methods were chosen, most airports responded in one of three ways. First, the most common response was the efficiency and practicality of their chosen methods. For instance, large airfields are best inspected with the use of a vehicle. Second, quite a few airports explained that their methods had proven successful over time and were based on experience. As one respondent shared, "Thirty-five years of experience says this is the way to do it." Third, although small airports with minimal staff may have one person dedicated to conducting inspections, other airports (both small and large) conduct inspections in teams. Whether an airport has multiple sets of eyes in the same vehicle or portions of the airfield inspected by different individuals, airports capitalize on the team approach. At least one airport acknowledged the benefits of sending two individuals in one vehicle on a self-inspection, to enable one person to concentrate on driving and avoiding incursions while the passenger focuses on the items being inspected. As one respondent explained:

> Part 139 self-inspections are a team effort. Operations personnel complete a portion of the inspection during each operational period (day, swing, and midnight). Dividing the daily self-inspection over multiple shifts ensures all areas are inspected by multiple individuals. If an issue is missed by one inspector, it is likely to be caught by the next.

Another respondent shared the practice of dividing areas of the airfield into units and assigning individuals to concentrate on Part 139 areas such as markings, lighting, pavement, and safety areas. In sum, airports appear generally pleased with the self-inspection methods in use at their facilities. Appendix G presents open-ended responses to this question.

Self-Inspection Techniques

In addition to the methods available for conducting self-inspections, various techniques are available to the airport operator. In reality, there are many different ways to conduct
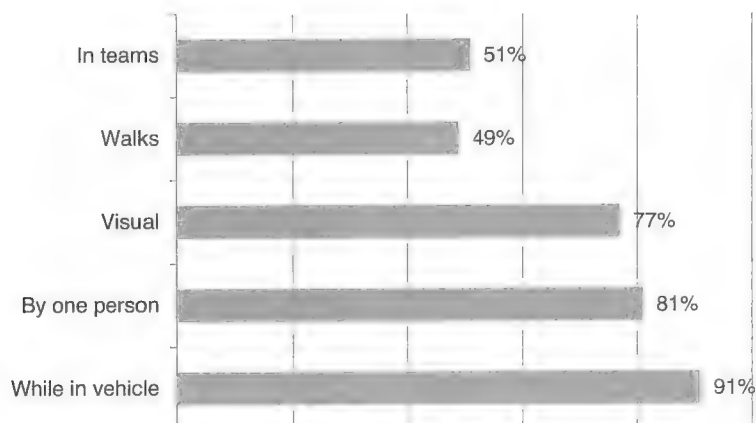
FIGURE 38 Self-inspection methods. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.
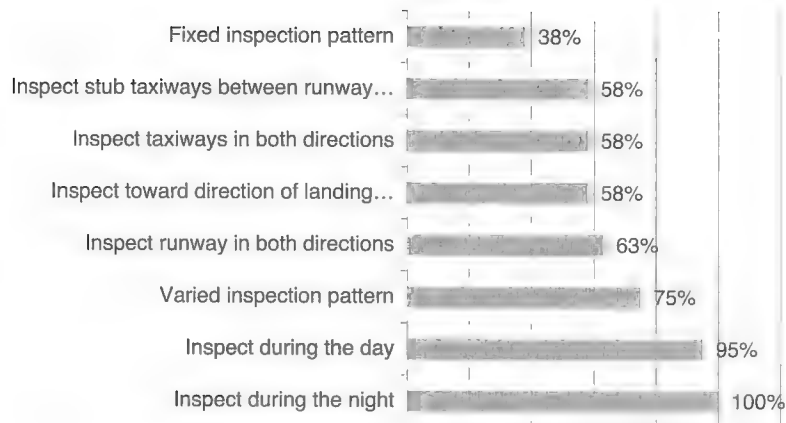
FIGURE 39 Self-inspection techniques. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.

a self-inspection, and it appears that participating airports utilize many of these. As seen in Figure 39, responses were diverse and comprehensive. Interestingly, 100% of participating airports conduct self-inspections during the night, with 95% also conducting inspections during the day. Participating airports also tend to favor a varied inspection pattern, rather than a fixed inspection pattern. When analyzing the data by hub size, GA airports have adopted many of the techniques, with 100% conducting varied inspection patterns, inspecting runways and taxiways in both directions, inspecting stub taxiways, and conducting both day and night inspections. Even so, only three GA airports participated in the study, so these results may not be inferred of GA airports nationwide.

When asked why an airport had chosen these various inspection techniques, respondents offered many ideas (Appendix G). Although several airports mentioned that inspection techniques differ among their personnel (as a matter of preference), the most common reason for using certain techniques centered on flexibility. Airports may alter their inspection technique based on aircraft operations, availability of the airfield, and the location of operations personnel at the start of the inspection. Other common reasons were (1) ensuring a

more complete inspection, (2) complying with an AC or Part 139, (3) cooperating with ATCT, and (4) continuing habits or routine. As one airport explained:

> Each duty operations manager has a choice on how he or she inspects the airfield; thus, pattern would be different from one individual to the next. Each is required to inspect all areas of the AOA and a varied approach works best by seeing the pavement in different directions. Runway inspections are toward the direction of landing traffic for safety reasons and this is specified in the letter of agreement with the FAA.

Equipment and Tools for Self-Inspection

Participating airports were also asked about the equipment or tools they use when conducting self-inspections. The majority of airports use a vehicle and a paper self-inspection checklist. Less frequently used are electronic devices and additional equipment, such as a friction tester. Although not offered in the answer choices, one respondent also mentioned their use of "shovels, brooms, plastic bags, PPE (gloves, hearing protection, eye protection, rain coats), liquid spill kits, haz-mat kits, measuring wheels, rulers, digital camera, cell phone, vehicle light bar equipped with spotlights & sirens, etc." Results are shown in Figure 40. Among the technology-driven tools, hand-held devices are used by 33% of medium-
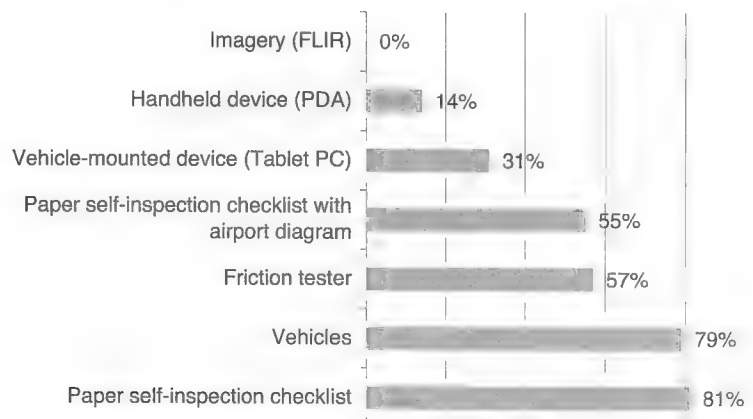
FIGURE 40 Equipment or tools used in self-inspections. *Note:* Participants were asked to select all that apply; thus, percentages do not total 100%.
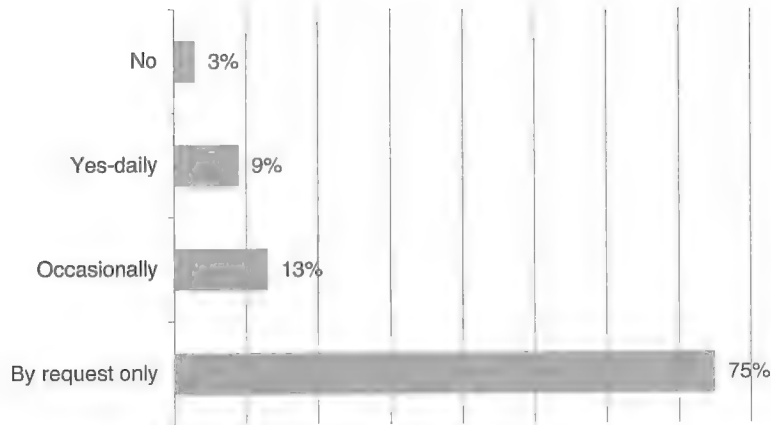
FIGURE 41 Airports allowing tenant personnel to ride along on inspection.

hub airports and 13% of small-hub airports. Vehicle-mounted devices are used by 36% of large-hub airports, 13% of small-hub airports, and 50% of non-hub airports.

An effort was also made to gain insight into the reasons why various types of equipment and tools were chosen by airports. Although responses varied, four themes emerged. First, the selection of tools and equipment was driven by the simplicity of the product. As one participant shared, "[Keep it Simple Stupid] KISS method." Second, the acquisition of equipment was based on its appropriateness for the airport. Third, the equipment enabled the airport to meet AC or regulatory requirements. Lastly, a lack of resources or cost-benefit analysis drove the decision-making process. Additional reasons include the proven success of the product, the efficiency or usability of the product, and the demand at the airport. One participant explained, "Over time [this equipment] has proven useful and we have a good track record." Appendix G presents all open-ended responses to this question.

Tenant Personnel

Although findings indicate that airport operations personnel are typically responsible for conducting self-inspections, airport tenants may become more involved with the process at some airports. Airports were queried about allowing tenant personnel the opportunity to ride along on an airport self-inspection. The majority of airports only allow this by request, whereas only one airport prohibits this practice. Results for this question are shown in Figure 41.

"Stories from the Field"

What makes your self-inspection program so effective?

Terry Blue: General Mitchell International Airport

Attention to detail! Get others involved on the administrative side. FOD Walks, safety area checks. Spend a lot of time on the airfield. Industry-trained. Hire some outsourced training, AAAE schools, and ACI. Hire outside folks for training on inspecting movement areas. FOD walks once a year for all 5 runways and all taxiways. Most of training is still done in-house, though.

Dave Jensen: Dane County Regional Airport

Comprehensive, checklist, multiple times a day. Inspect six times daily.

Doug Kreulen: Huntsville International Airport

It is successful because we are always prepared and do things 100% every day. Instead of "gearing up" for an FAA Inspection, our airport actually uses the same checklist that the FAA uses while conducting our daily self-inspections.

REPORTING DISCREPANCIES AND FINDINGS

One of the reasons for conducting self-inspections is to find and report discrepancies. Although the term "discrepancy" typically refers to a condition that is not in compliance with Part 139, more broadly, the term "discrepancy" may refer to any unsafe airport condition that needs correction. Although some airports may adopt stricter standards than spelled out in Part 139 or AC 150/5200-18C, any airport condition that is considered unsafe must be reported and corrected promptly (FAA 2004). The manner in which discrepancies are addressed will depend on the nature of the discrepancy, the department or individual to which they are reported, the manner in which they are reported, and the urgency of the request. This reporting process will determine how efficiently the discrepancy is corrected. As required by Part 139.327, each certificated airport must have "a reporting system to ensure prompt correction of unsafe airport conditions noted during the inspection, including wildlife strikes" (Certification of Airports 2004, p. 24).

NATURE OF THE DISCREPANCY

The nature of a discrepancy found during a self-inspection will dictate the manner in which the discrepancy is addressed. If the conditions noted during an inspection cannot be promptly corrected, several options are available to the airport operator, depending on the situation. First, a NOTAM may be issued. NOTAMs are important in complying with the requirement of Part 139.327(b)(2) to "ensure rapid and reliable dissemination of information between the certificate holder's personnel and air carriers," as well as Part 139.339 (Certification of Airports 2004, p. 24). Second, an area may be closed or restricted. As Part 139.343 states:

> Whenever the requirements of subpart D of this part cannot be met to the extent that uncorrected unsafe conditions exist on the airport, the certificate holder must limit air carrier operations to those portions of the airport not rendered unsafe by those conditions.

In closing a pavement, airports must ensure that closed areas are properly marked and lighted, as detailed in AC 150/5370-2E. A third option, many times used in conjunction with the two items previously mentioned, is for inspection personnel to issue a work order for resolution of the issue by appropriate personnel. Additionally, the discrepancy may be noted on a self-inspection report, with a record of the correc-

tive action. It should be noted that airports may adopt standards that are stricter than regulatory requirements. As a result, a condition may trigger a work order or pavement closure at one airport and not at another.

REPORTING METHODS

An effective safety self-inspection program includes procedures for reporting and correcting deficiencies (FAA 2004, p. 3).

For airports to correct deficiencies in an expeditious manner, it is imperative for these deficiencies to be reported to appropriate personnel to ensure prompt resolution. Although inspection personnel may be equipped and skilled to address certain issues encountered during a self-inspection (such as removing FOD, or possibly even using cold patch to repair a small spall), often maintenance personnel are relied on to address issues needing correction.

Reporting methods differ among airports. These methods vary depending on staff, airport size, and technology available at each airport. Often, for urgent requests, company radio or telephone is used to contact maintenance personnel immediately. Less urgent requests may be communicated by e-mail, text message, phone message, fax, radio, or paper or electronic work order. Airports that use electronic or computerized self-inspection programs may have the ability to initiate work requests from the field through an in-vehicle self-inspection platform. Regardless of the method, it is helpful to follow up with appropriate personnel to ensure the work request was received as issued. Whether faxed, e-mailed, or sent through company mail, it is incumbent upon the individual initiating the work request to make certain that the request was received. At airports with a work order system, this follow-up may be automatic, in the form of a work order number assigned to a request.

Oftentimes, discrepancies are discovered by personnel conducting self-inspections during the night or weekend. As a result, reports of discrepancies may need to be made outside normal business hours. Although many large airports have at least some degree of maintenance staffing during the weekend and night shifts, alternate reporting procedures may need to be adopted for airports without sufficient personnel during these times. These procedures may involve the use of

on-call personnel, better equipped self-inspection personnel, or the more frequent use of NOTAMs to restrict or close areas. At one airport, for instance, operations personnel are equipped with a bag of asphalt cold patch and a tamping tool to repair spalls on the runway quickly and temporarily if they are discovered while maintenance personnel are not present. This one procedure likely prevents unnecessary closures of runway pavement at this airport.

"Stories from the Field"

Fort Lauderdale–Hollywood International Airport (FLL) is a firm believer in the ability of GIS to enhance efficiency and reduce the workload of personnel. Specifically, the GIS used at FLL provides a foundation for the airport's work order system. For instance, if inspection personnel discover an inoperative taxiway light, the combination of a GIS map of airfield lights and the vehicle's GPS location will identify the light needing repair. A web-based work order is then completed, requesting the light be repaired, and is submitted remotely to the airport's computerized maintenance management system. A report is then generated by the computerized maintenance management system showing the location of the light, a part list, and the warehouse location for replacements. The report is automatically e-mailed to maintenance personnel. Once the repair is completed, the maintenance technician completing the work can e-mail a completion report back to the airfield inspector, who can then check the repair and submit a final inspection report. By electronically tracking inspections and work orders, the airport is better prepared for their annual Part 139 inspection. According to Tim Neubert of Neubert Aero Corp.:

> The authorities will say 'I see you have a work order that was generated three months ago; I'd like to see that work order and the corrective action.' In the early days, you'd have to sift through mounds of paper to find that form. Now, you can pull up a list of open and closed work orders, identify the one you need, and show corrective action almost immediately, without leaving your desk.

Further, he adds, "Papers are traditionally lost, and often changes to documents took place after the fact. Electronically filing this information, which is date and time stamped, reduces an airport's risk and liability by allowing greater accountability in reporting."

Source: Garrett 2010.

ORDER OF PRIORITY

In AC 150/5200-18C, the FAA encourages airports to "determine which problems require immediate attention and treat those with the highest priority" (FAA 2004, pp. 3–4). Clearly, upon discovery, certain issues may require more urgent attention. For instance, a runway spall exceeding

Part 139 specifications may require an immediate runway closure and emergency response by maintenance personnel, whereas a broken taxiway edge light may only require a notation on the self-inspection form with follow-up to maintenance by means of a work order. By making the order of priority for discrepancies a part of the airport's self-inspection program and communicating this to all involved, self-inspection personnel will be prepared to prioritize issues correctly as they are encountered.

CURRENT AIRPORT REPORTING PRACTICES

Certificated airports are required, under Part 139, to report certain types of information in two ways. First, as discrepancies are discovered during a self-inspection, they are reported to appropriate personnel to ensure prompt resolution of the discrepancy. Second, personnel then report certain types of information, such as pavement closures and out-of-service facilities, to air carriers utilizing the airport. Thus, the present survey was designed to gain insight into these two types of reporting requirements.

Reporting Unsafe Conditions

First, participating airports were queried about the manner in which they report discrepancies for resolution. Specifically, Part 139.327 requires "a reporting system to ensure prompt correction of unsafe airport conditions noted during the inspection" (Certification of Airports 2004). Participating airports were asked to explain how this is accomplished at their airport. By far, the most common theme centered on a computerized work order system (Appendix G). Several airports also utilize a written or paper-based work order system. Several airports explained that, based on the urgency of the request, maintenance personnel may be contacted immediately by means of the phone or radio. Although the manner in which unsafe airport conditions are reported varies to some degree, it appears from the responses that all airports have an effective system in place to meet this requirement. As explained by one airport:

> Any unsatisfactory conditions noted during an inspection will be recorded on the airport's approved inspection checklist. A phone call is made to the on-duty Airfield Maintenance staff for unsatisfactory conditions requiring action to be taken, and a follow-up e-mail is completed and routed to the Airfield Maintenance staff (and copied to the Airside Operations staff).

Disseminating Information to Air Carriers

Part 139.327 requires "procedures, facilities, and equipment for reliable and rapid dissemination of information between the certificate holder's personnel and air carriers" (Certification of Airports 2004). Participating airports were presented with an opportunity to share how this was being accom-

plished at their airport (Appendix G). First, responses show that the NOTAM system is utilized as needed. As to additional means of disseminating information to air carriers, the fax is most common. Airports also utilize e-mail and the telephone, with several airports posting information on their website or delivering hard copies to airline personnel. Indeed, one airport communicates with air carrier personnel "via OpsNet software . . . which is used for issuing NOTAMs and communicating information about the Airport's status to air carrier personnel." Another airport explained their system as follows:

> Unsatisfactory conditions that cannot be promptly corrected by our maintenance department shall be identified and disseminated by NOTAM in accordance with Part 139.339, Airport Condition Reporting. NOTAMs will be filed through the FSS and faxed to all affected tenants. A Code Red paging and telephone alerting system can also be utilized if a situation or condition has an immediate negative impact to the operations of the airport.

CHAPTER FIVE

FOLLOW-UP AND CLOSE-OUT

Follow-up and close-out are critical components of any self-inspection program. Among some certificated airports, this is an area that has commonly resulted in a discrepancy finding during an annual Part 139 inspection. By properly following up with appropriate personnel after having reported any discrepancies, as well as closing out discrepancies once they have been corrected, airports are able to close the loop on items of concern.

FOLLOW-UP

To ensure that work has been completed, a follow-up process is typically adopted by airports. Once the work has been completed, it is beneficial to report this to the individual who initiated the request. In this way, the issue can be closed out, including canceling any NOTAM(s), reopening pavement, or simply verifying that the work has been completed satisfactorily. Without the closing of the feedback loop, inspection personnel may lose track of work that needs to be completed and items previously reported may be reported again, thus generating duplicate work requests.

Various methods are available to airports for following up with appropriate personnel to ensure that a reported discrepancy is resolved. Rather than requiring inspection personnel to follow up with maintenance personnel to determine whether or not an issue has been closed out, airports typically develop a procedure whereby those resolving the discrepancy (i.e., maintenance personnel) communicate this to inspection personnel. At airports with a paper-based work order system, this may be communicated via phone call, radio call, or e-mail, or face-to-face. In other words, once an issue has been resolved by maintenance personnel, contact is made with inspection personnel noting that fact. At airports with electronic work order systems, maintenance personnel (possibly through Work Control) close out a work order in the system. Typically, a confirmation of this is e-mailed to the individual reporting the issue to enable confirmation of close-out. This system may or may not be accessible to operations personnel.

Although it remains the responsibility of inspection personnel to make certain that reported discrepancies are resolved, in many cases the individual reporting the discrepancy may not be the same individual who actually works to resolve the discrepancy. For instance, in the event of a broken taxi-

way direction sign, the problem may have been discovered by an individual in operations who was performing an inspection, who then reported the broken sign to the operations supervisor, who then reported the problem to maintenance work control, who then reported it to a maintenance employee, who then deemed that a new sign must be ordered. After this process has taken place, it is important for operations personnel to check in with work control, which must then check in with the maintenance employee, who must then check in with the sign manufacturer or supplier to ensure that a new sign is on its way, as well as determine the estimated delivery and installation date.

Additionally, it is beneficial for airport personnel to consider the degree to which airport operations may be affected by the discrepancy. For example, if a glideslope is inoperative, lights are inoperative, or signs are out of service, a NOTAM may be justified so that pilots are aware of these discrepancies before they depart or arrive at the airport, allowing sufficient time to plan ahead for the degraded equipment. Further, airport operations personnel may need to schedule the closure of pavement to allow maintenance personnel proper time to resolve a discrepancy.

CLOSE-OUT

The final step of the inspection process is to close out any discrepancies that have been resolved. Without this step, there is no closure to any reported discrepancies. The actual process of closing out a discrepancy varies among airports, but occurs in much the same manner as the follow-up stage. During the course of following up, the individual may find that the situation has been addressed and sufficient verification exists to prove that fact, thus allowing the issue to be closed out. As part of the close-out process, documentation of the resolution is generally made so that the open item is no longer considered active. This may involve closing out an open work order and canceling any NOTAMs associated with the item. A documentation process can be rather simple, including a description of the discrepancy; the individual discovering it; the date, location, and manner in which it was resolved; and the name of the individual closing out the discrepancy. This type of documentation can be beneficial to an airport, as it allows for review of the types of discrepancies most frequently addressed, as well as the corrective measures most effective at remedying each

issue. If discrepancies are not documented in some fashion after they have been resolved, one never knows which discrepancies are no longer a concern without inspecting the areas again. At the very least, it is important that an effort be made to close out each discrepancy to confirm that the situation has been handled in a satisfactory manner, thus allowing normal operations to resume.

With the October 7, 2010 issuance of the Notice of Proposed Rulemaking, *Safety Management System for Certificated Airports,* sufficient documentation of resolved discrepancies became even more important for certificated airports. Self-inspections are part of the audit process required under the Safety Assurance component of the Safety Management System, and by properly documenting inspections as well as discrepancies as they are discovered, reported, and resolved, airports will properly support the audit process. With proper documentation, trends can be analyzed and airports can identify, for instance, areas of increasing hazards, such as a construction site that becomes a prolific generator of FOD or an area where unauthorized engine runs are being conducted, resulting in soil erosion from jet blast. It should be noted that the Notice of Proposed Rulemaking would require certificated airports to implement the Safety Management System throughout the airport environment, including both movement and non-movement areas. Thus, airports focusing on documenting and reporting discrepancies in movement areas would need to ensure a focus on non-movement areas as well (Safety Management System 2010).

CURRENT AIRPORT FOLLOW-UP AND CLOSE-OUT PRACTICES

When queried as to the methods used to follow up on discrepancies and ensure their resolution, airport responses were varied. As seen in Figure 42, the use of an electronic work order

"Stories from the Field"

At Gulfport–Biloxi International Airport, discrepancies discovered during a self-inspection are noted on a paper and on an electronic checklist, with discrepancies entered into an electronic work order system, which produces a corresponding work order number. If the discrepancy is an immediate hazard to aviation safety, appropriate action is taken by airport operations personnel. For example, a NOTAM may be issued, an area may be closed, and airport maintenance will be immediately notified to correct the issue. Operations personnel regularly monitor all Part 139-related work orders in the system. Once work is completed, work orders are closed out by maintenance personnel, with information such as completion date and specific work performed. At this point, the work order moves from the "open" work order list to a "closed" work order list. If a work order will not be closed out in a reasonable time, airport maintenance personnel will update the work order and include notes, such as parts on back order, that work will be completed during scheduled runway closure, and so forth.

Source: C. Lyons, Gulfport–Biloxi International Airport.

system is quite common, but participating airports also rely on a paper work order system and maintenance briefings, as well as confirmations through e-mail and telephone, and face-to-face. Large-hub airports tend to utilize an electronic work order system (91%), with 64% also utilizing e-mail confirmation. All medium-hub airports utilize an electronic work order system, with 50% also utilizing e-mail confirmation. Small-hub, non-hub, and GA airports tend to rely on a paper work order system, with maintenance briefings as appropriate.
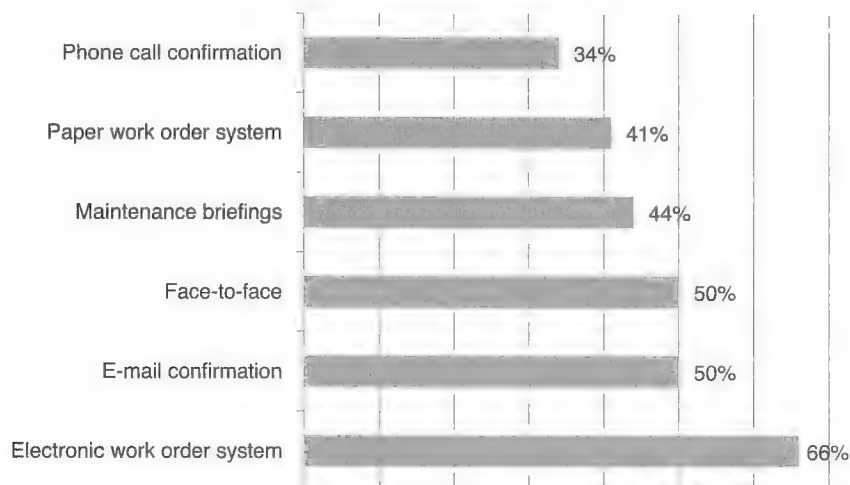
FIGURE 42 Methods for follow-up of discrepancies. *Note:* Participants were able to select all that apply; thus, percentages do not total 100%.

When presented with an open-ended question asking the manner in which items reported on the self-inspection are properly closed out, participating airports typically answered in one of two ways (Appendix G). First, if the airport has an electronic work order system, the individual could either log onto this system to determine if an item has been closed out or, in some cases, the system would generate an automatic e-mail to the individual reporting the issue. Second, if the airport has a paper work order system, the maintenance department could be contacted to verify that an item has been closed out or the individual may receive a copy of the paper work order noting that the item had been closed out. Airports also commonly visually verify previously noted discrepancies to ensure that the work was completed to standards. Delving deeper into this topic, participating airports were also queried to determine at what point an issue is considered closed out. The majority responded by saying that an issue is considered closed-out once work has been completed according to Part 139 standards. Visual verification of this is often performed by operations personnel to verify work completed by maintenance personnel.

CHAPTER SIX

QUALITY CONTROL

An integral component of any successful self-inspection program is a focus on quality control. Perhaps second in importance only to training, an effective quality control component will ensure the continued success of a self-inspection program, preventing complacency from negatively impacting airport safety. Indeed, just as in the business world, quality control is seen as extremely vital to the success of a company. Likewise, quality control is an important issue in the aviation industry, and specifically to airport self-inspection programs. Although technology in its various forms has greatly enhanced aviation safety, the human component continues to be a weak link in the system, and without a focus on quality control, that link continues to degrade. Because personnel are involved with airport self-inspection programs, a focus on the human component is important.

HUMAN FACTORS

With humans responsible for conducting airport self-inspections and managing the overall airport self-inspection program, the human component is ever-present. With this in mind, airports are confronted with various human factors. Considering these human factors and developing methods to minimize any negative consequences associated with them are important components to any airport self-inspection program.

As noted in AC 150/5200-18C, complacency is one such human factor (FAA 2004). Among airports participating in this synthesis, complacency among personnel was recognized as having the most significant impact on self-inspection programs. Particularly for personnel conducting self-inspections, this task consumes a significant amount of time and is carried out daily, often several times each day. As such, the process of conducting a regular self-inspection can become rather repetitive in a short time. Inspections after accidents or incidents, as well as other special inspections, can generate excitement for inspection personnel because they do not occur frequently and they have a level of urgency or importance associated with them. Even so, the vast majority of inspections conducted at airports are performed daily with a focus on the same items each time. Thus, methods to mitigate the effects of complacency are important. Management oversight, in the form of audits on those performing self-inspections, is one such method. Audits allow management not only to ensure that inspection personnel are performing their job correctly, but also demonstrate to personnel the desire of management to hold the work of inspection personnel to a high standard. Airports may also address complacency with job rotation, training, and the use of varied inspection patterns (FAA 2004).

Yet another human factor is fatigue. In the 24/7 environment of an airport, fatigue can be quite common among personnel working nonstandard hours. Rotating shifts, night shifts, quick turns, and other anomalies of the airport work environment can often lead to reduced sleep and fatigue, thus negatively impacting alertness levels. With lower levels of alertness, inspection personnel may overlook issues that would have been discovered had fatigue not been an issue. Although this unique attribute of the airport environment may be unavoidable, efforts can be made to minimize quick turns and rotation among shifts. Further, some individuals are more inclined to work night-shift hours, and airports might take this into consideration when assigning shifts. Additionally, the negative consequences of a 24/7 environment may be reduced through adequate time off and flexible schedules (Krause 2003).

Although likely not as prevalent, a "macho" attitude exhibited by personnel is yet another human factor to be considered. This characteristic may arise in personnel greatly experienced in performing inspections or may simply be an attribute of a new employee. In either case, this human factor requires that management remain perceptive of personnel exhibiting this characteristic. Once the trait is detected, management may wish to emphasize (1) the ever-present possibility for runway incursions, overlooked FOD, or Part 139 issues; (2) the need for personnel to always pay attention to detail; and (3) the benefits of altering the inspection routine.

Likewise, personnel may exhibit characteristics at the other end of the spectrum, namely, a lack of confidence. This can result in incomplete self-inspections, as well as the inadequate reporting of discrepancies and the action necessary to resolve them. Typically more common with inexperienced personnel, a lack of confidence can be addressed by adequate training, job shadowing, and positive feedback to personnel (Krause 2003).

In addition to the human factors of complacency, fatigue, macho attitude, and lack of confidence, the loss of situational awareness (SA) can, at one time or another, affect all inspection personnel. Although an emphasis on maintaining SA is

an important component of pilot training, airports may not place an emphasis on SA in self-inspection training. It may be assumed that inspection personnel, once trained, will be able to maintain proper SA. However, SA during self-inspections can be degraded in low-visibility conditions, with the use of radio or cell phone, and with distracting passengers, among other conditions. Owing to the various ways in which SA can be negatively affected, airports may find it challenging to confront this issue adequately. However, by developing a formal self-inspection program with proper procedures and ensuring that personnel are aware of the conditions that might cause loss of SA, airports can effectively mitigate the loss of SA among self-inspection personnel (Krause 2003).

Regardless of which human factors are affecting self-inspection personnel, it is beneficial to address these factors in training self-inspection personnel, both initially and recurrently. Likewise, promotion and awareness programs may be used to educate personnel on various human factor issues, common issues faced by personnel, and methods to mitigate the negative consequences associated with human factors. Whether developed by management or borrowed from peer airports or the FAA, these programs may prove vital to an airport in maintaining a successful self-inspection program. Additionally, employee turnover can be another factor in addressing human factor issues. New personnel may receive conflicting messages if they observe more experienced personnel being complacent in performing their self-inspection duties, especially if the complacent employee is not corrected by a supervisor. Therefore, airports are encouraged to consider both of these factors and attempt to always have a mixture of new and experienced personnel, as well as have methods in place for terminating employees who consistently turn in a lackluster performance.

In sum, the responsibility for addressing human factor issues and working to negate them rests with the airport operator. Thus, it is beneficial for airports to develop a plan to combat the human factor issues presented in this chapter, educate their personnel on the topic, and provide motivation for personnel to avoid falling victim to human factor issues that can negatively impact the safety of the airport. By stressing the potential liability faced by inspection personnel if duties are neglected and a discrepancy is overlooked, and by emphasizing the FAA requirement for self-inspections, airports are able to highlight the importance of a proper self-inspection. Regardless of the methods used, it is beneficial for airports to remain keenly aware of the human factor issues that can affect a self-inspection program, and to create a plan to educate personnel to avoid falling victim to these factors.

CONTINUAL IMPROVEMENT

The area of human factors is not the only area that affects quality control of an airport self-inspection program. Many airports have adopted a continual-improvement mind-set that

guides everything they do, including their self-inspection program. For example, the Metropolitan Nashville Airport Authority has adopted the Six Sigma process improvement methodology as the cornerstone of its continual improvement activities. By building a culture of continual improvement and business excellence, the Authority has thus far improved maintenance work order flow, valet parking, tenant implementations, and contract compliance ("MNAA Champions Six Sigma" 2006). Clearly, this continual improvement mind-set could be implemented to improve an airport's self-inspection program. An airport with a similar approach is Boston–Logan International, operated by the Massachusetts Port Authority. With a collaborative approach to improving airfield safety, the airport has developed "Tiger Teams" with representatives from the Massachusetts Port Authority, airlines, the FAA, and industry experts. These teams have developed an action plan that established long- and short-term goals for improving airfield safety at Boston–Logan. According to the airport, many of the initiatives the airport has undertaken in the last few years are a direct result of that effort (Richards 2009).

A more specific approach to continual improvement of a self-inspection program involves a "mock" Part 139 inspection. With this method, an airport invites personnel from a peer airport to visit and carry out a mock Part 139 inspection. By gaining insight from peers and a fresh set of eyes, an airport can improve its self-inspection program. Yet another option involves visiting peer airports to learn about their self-inspection program. From training to inspecting, documenting findings and close-out, airports are often willing to share their practices for the benefit of another airport. As one airport-respondent stated, "There is significant benefit to peer learning."

QUALITY CONTROL IN THE INDUSTRY

Although quality control (QC) efforts among airports are the highlight of this chapter, QC efforts are also in use throughout the aviation industry. One such effort is the FAA-approved Operational Safety Audit Program of the International Air Transport Association (IATA). This program is internationally recognized and designed to "assess the operational management and control systems of an airline" (IATA 2011, para. 1). As explained by IATA, airlines and regulators achieve the following benefits:

- Reduction of costs and audit resource requirements for airlines and regulators;
- Continuous updating of standards to reflect regulatory revisions and the evolution of best practices within the industry;
- A quality audit program under the continuing stewardship of IATA;
- Accredited audit organizations with formally trained and qualified auditors;

- Accredited training organizations with structured auditor training courses;
- A structured audit methodology, including standardized checklists;
- Elimination of audit redundancy through mutual acceptance of audit reports; and
- Development of auditor training courses for the airline industry (IATA 2011, para. 2).

Although a similar system of external audit could be applied to airport self-inspection programs other than the annual Part 139 inspections by the FAA (or state aviation agencies in the case of non-certificated airports), this is not currently the case.

CURRENT AIRPORT QUALITY CONTROL PRACTICES

Quality control of an airport's self-inspection program involves addressing human factors and conveying the importance of the self-inspection program to personnel. As part of this synthesis, participating airports were queried on these two QC components.

Importance of Inspections

First, participating airports were asked which reasons they use to convey the importance of inspections to inspection personnel. When presented with several choices, participating airports were most likely (90%) to stress the FAA requirement of conducting self-inspections. A high number also stressed the potential for aircraft accidents (87%) and the potential liability of improperly conducting inspections (84%). Only 58% of airports stressed the potential for penalties to airport personnel. A common theme in the "Other" category was the need for personnel to take pride in their airport.

Factors with a Negative Impact

As part of the synthesis, participating airports were asked about the degree to which various factors negatively impact self-inspection personnel and their ability to carry out the airport's self-inspection program. As seen in Figure 43, the following factors have some to little impact on self-inspection personnel: complacency, fatigue, noise or distractions, lack of awareness, inadequate time to carry out inspection, and overconfidence. However, the majority of participating airports believed that inadequate training and lack of confidence have no impact on their self-inspection personnel and their ability to carry out the airport's self-inspection program. Interestingly, complacency is the only factor that has significant impact at more than 15% of participating airports.

Methods to Minimize Complacency

In response to this finding on complacency, airports were asked specifically what methods they use to minimize complacency among personnel conducting self-inspections. Figure 44 presents the most common methods. Among all hub sizes (except GA), training and management oversight are relied on most commonly. However, at participating GA airports, audits and requiring varying inspection routes are the only methods relied on to minimize complacency.

Methods to Ensure Quality Control

Participating airports were also queried as to how they ensure QC in the self-inspection process (including training, inspecting, and documenting). Although responses varied among airports, several themes were identified by respondents (Appendix G). The most common theme identified was management oversight. Whether this took the form of management review of completed daily self-inspection forms, an occasional ride-along on an airfield inspection, regular audits, or simply an overall awareness of an employee's abilities, involvement by management is key in ensuring QC at many airports. Another common theme centered on training. These airports believe that with proper training (both initial and recurrent), a certain degree of QC can be ensured. Additional themes include peer review, shift debriefing, proper documentation, and personnel
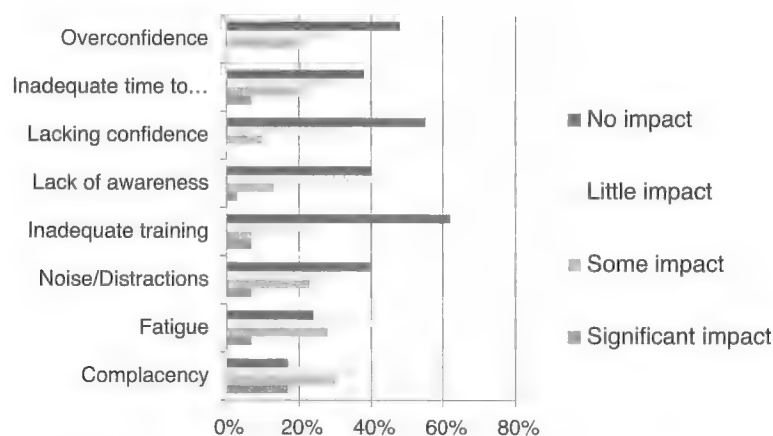
FIGURE 43 Factors negatively impacting self-inspection personnel.
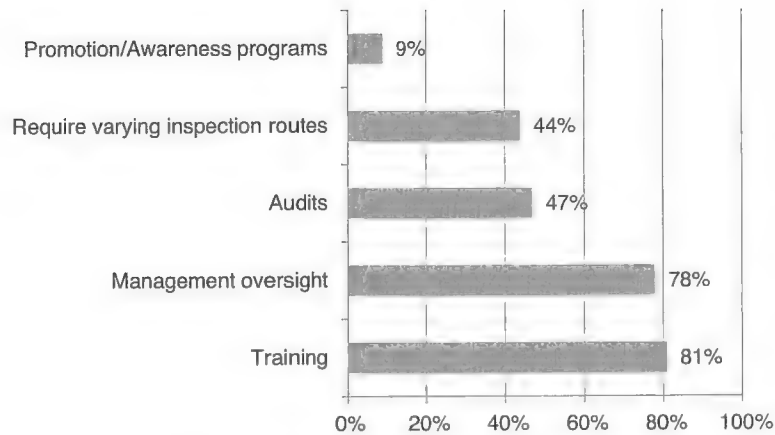
FIGURE 44 Methods to minimize complacency. *Note:* Participants were able to select all that apply; thus, percentages do not total 100%.

taking ownership in the process. One participant explained efforts to ensure QC as follows:

[We ensure quality control] by conducting weekly/monthly audits to ensure nothing falls through the cracks or is overlooked or omitted. The airside 139-qualified officers are also given individual "ownership" responsibilities pertaining to sections of 139. These individuals will coordinate with Airside Supervisors and the Manager to ensure inspection follow-up and closure is completed, the training program is up-to-date and documentation is 139-compliant 365/24-7.

CHAPTER SEVEN

OVERSIGHT

For certificated airports, regulatory oversight of airport self-inspection programs is provided by the FAA. For non-certificated airports, oversight is often provided at the state level. Specifically, the department of transportation in some states is responsible for inspecting non-certificated airports to ensure standards are being maintained. This chapter presents insight into both FAA and state-level oversight of airport self-inspection programs.

FAA OVERSIGHT

In addition to guidance at the national level (in the form of FAA CertAlerts, ACs, and regulations) addressed in chapter one, the FAA carries out oversight of certificated airports by conducting annual Part 139 inspections. During a certification inspection, FAA inspectors are observing two distinct aspects of the operation of the airport:

- The documentation of the airport's operation (including training, self-inspection, procedures, etc.); and
- The actual condition of the airport and a demonstration of its operation (movement area inspections, ARFF drill, etc.) (Lammerding 2009).

Ideally, the inspection will see documentation that Part 139 requirements are being met and an airport condition that confirms the documentation (Lammerding 2009). It is in the airport's best interest to provide sufficient documentation and a Part 139-compliant airport; however, it is possible that an FAA inspection may find one of the following situations:

- The documentation states that requirements are met, but the current airport condition does not show it.
- The documentation does not show that the requirements are being met, but the current airport condition meets Part 139 requirements.
- The documentation does not show that requirements are being met, and neither does the condition of the airport (Lammerding 2009).

Regarding the condition of the airfield, FAA inspectors often notice larger issues that may not be noted in self-inspection reports. For instance (Lammerding 2010b), FAA inspectors may notice:

- Things that take a long time to deteriorate:
  - Pavement
  - Paint and sign panels
- Long-term issues:
  - Safety area obstructions
  - Ponding/drainage
  - Wildlife
- Difficult-to-access areas:
  - Runway safety areas

To assist airports in improving their self-inspection programs and in better meeting the requirements of Part 139, this synthesis examined FAA oversight at the regional level. This was designed to gain specific insight into quality practices within each region.

FAA-Observed Best Practices for Training

In an effort to highlight successful training practices, each lead certification safety inspector was asked to share best practices among airports in his or her region for training self-inspection personnel (Appendix H). Although responses were richly varied, several themes emerged. First, successful airports take advantage of industry training. Whether this training is provided by an industry organization (such as the American Association of Airport Executives ACI, or a private provider), it is seen as a successful practice by several lead certification inspectors. A second theme was on-the-job training. Although classroom training with airport-specific photos, as well as photos of items considered a discrepancy, is considered a successful practice, it is most effective when combined with on-the-job training. A final theme that was shared by more than one inspector was the practice of visiting peer airports. By taking time to send personnel to airports with well-developed training programs, lessons can be learned, new ideas can be generated, and an airport's training program may be improved as a result. Summarizing most of the comments, one lead certification inspector shared the following successful practices for training:

> Regular self-inspection training, including reviews of FAA Advisory Circulars. Conducting 'mock' 139 inspections in-house, by assigning an employee to act as if they were the FAA doing an inspection. Developing airfield-specific training programs with actual pictures of the airfield and pictures of discrepancies versus corrected items. Power[P]oint presentations. Testing. Hands-on training is one of the best tools, after someone reads

about it in the Advisory Circulars. Being able to go to other airports and conduct inspections with other people that do the same job. Networking with other airports.

When asked whether their region's expectations differed from Parts 139.303 and 139.327, it became apparent that there were no differences (Appendix H). However, one lead certification inspector, offering further explanation, shared:

Airport familiarization, as an example, is more than what is the color of the markings. Each individual must know the type of marking, the correct name, and location of each marking used on the airport. The same process is used for the signs and lighting. Training requirements are based on the level of responsibility. The higher the level of responsibility, the more in-depth and detailed the training requirements. Training curriculums and training programs are required for each assigned task, including fuel safety inspections and wildlife control.

FAA Suggestions for Strengthening a Self-Inspection Program

Lead certification inspectors were also asked how airports could strengthen their self-inspection program, including the training of personnel conducting self-inspections. Although inspectors mostly offered unique responses, several themes emerged (Appendix H). First, by reaching out to other certificated airports with exceptional self-inspection programs, airports can gain insight into successful practices currently in use. This knowledge of the practices of peer airports was a theme that continued to appear in comments by certification inspectors. Next, airports can strengthen their programs by using a variety of training materials and techniques. As one inspector shared, "Ensure that airports know that well-rounded self-inspection training should include knowledge of the law, the Airport Certification Manual, and the associated Advisory Circulars." Additional comments included requiring personnel to teach the subject, hiring an individual with experience in training, and nurturing the personnel and resources to develop an effective self-inspection program.

FAA-Observed Best Self-Inspection Practices

Lead certification inspectors were also asked to share some of the best self-inspection practices they have observed within their region. In response to this question, many unique practices were shared (Appendix H). Although few themes were identifiable, the comments were beneficial nonetheless, and are categorized below.

Training

- Visit peer airports;
- Assign specific training topics to personnel to create ownership and knowledge acquisition; and
- Use photos of items considered acceptable and non-acceptable in training.

Inspecting

- Rotate personnel conducting self-inspections;
- Conduct self-inspections during both daylight and darkness;
- Conduct in-depth focus area inspections;
- Conduct inspections slowly, including slow-moving FOD inspections;
- Conduct runway inspections near the edge, both sides, then center (three passes total);
- Don't stay on the taxiway centerline during taxiway inspection;
- Get out of vehicle and walk runway and taxiway safety areas;
- Conduct multiple inspections daily;
- Utilize computer- and web-based inspection tools with GIS mapping;
- Use nonstandard inspection patterns;
- Establish standards to determine when a condition is no longer acceptable;
- Inspect runway lighting on step 1; and
- Close pavement for detailed inspections.

Reporting discrepancies and findings

- Utilize an electronic work order system.

General FAA Suggestions

Lastly, each lead certification inspector was encouraged to share any remaining thoughts regarding self-inspections (Appendix H). Although responses were too unique for any themes to emerge, the feedback was informative.

Self-inspection dos

- Visit peer airports;
- Rotate personnel to ride along with the FAA during a Part 139 inspection;
- Use photos in training to show personnel what to look for;
- Work with the regional FAA office for assistance in developing a training program;
- Adopt a comprehensive self-inspection checklist with an airport diagram; and
- Adopt a method to show closed-out discrepancies (electronically is preferred).

Self-inspection do-nots

- Do not allow fire department personnel to conduct self-inspections, when these same personnel are dual-tasked with firefighting duties;

- Do not drive too fast during an inspection; and
- Do not continually stay in the vehicle during an inspection.

Additionally, the FAA regional offices provide helpful resources for airports. PowerPoint presentations, quick reference guides, sample training topics, and CertAlerts are just some of the resources made available to airports by FAA regional offices.

Summary of FAA Oversight

Clearly, each regional FAA office has unique perspectives and information to share with airports. Because airports typically only gain input from the office located within their region, the insight provided by the regions that responded to the survey may prove helpful to airports in considering perspectives of lead certification inspectors throughout the United States. Overall, it appears that several ideas are shared by most of the regional lead certification inspectors. First, visiting peer Part 139 airports with successful practices is considered good business. For airports so inclined, each FAA regional office can provide names of airports to consider, with contact information. Next, airports might consider using airport-specific photos with examples of discrepancies and items meeting standards in their training. By supplementing self-study of the ACs and Part 139 with photos of what to look for and what to consider a discrepancy, inspection personnel will be more effective in conducting self-inspections. Next, requiring self-inspection personnel to become subject matter experts and teach the subject matter to their coworkers will encourage ownership and stimulate knowledge. Lastly, it is important that self-inspection personnel adopt effective techniques for conducting self-inspections, such as performing multiple inspections each day during both daylight and hours of darkness, conducting inspections slowly and thoroughly while occasionally exiting the vehicle to walk pavement and safety areas, and adopting non-fixed inspection patterns.

STATE OVERSIGHT

Responsibility for Inspecting

In states in which non-certificated airports are inspected, the state department of transportation is typically responsible. These inspections are often not as in-depth as inspections conducted by the FAA for certificated airports, but are important nonetheless. Often, the state aviation agency conducts an inspection to fulfill the requirements of the Airport Safety Data Program. This program is the conduit through which important airport information is collected and disseminated to airport users through the Airport Facility Directories. Although there is no regulation requiring that non-certificated, public-use airports must be inspected at any regular interval, there are measures in place to ensure that these airports are inspected at least on a triennial basis. The purposes of the airport inspections are to (1) verify the accuracy of the data on FAA Form 5010, (2) update the data as necessary, and (3) report conditions to airport users.

All airport facilities in the United States are inspected on a regular basis, whether they are certificated or non-certificated. Under contract to the FAA, GCR & Associates, Inc. (GCR) developed 5010Web.com, a secure, web-based application allowing federal and state airport inspectors the ability to transmit inspection data directly to the FAA over a secure Internet application. The inspection data are transmitted to the FAA on a 56-day cycle, and are ultimately published in the Airport Facility Directories (M. Romero, personal communication, Oct. 14, 2010).

Since 2004, through an annual grant from the FAA, GCR has been responsible for the National Airport Safety Data Collection Program (collection of safety data for all non-primary public and private airports in the National Flight Data Center database). The program consists of field inspections of public-use airports conducted by state aviation departments. In cases in which the state agency expresses a need for assistance, GCR subcontracts the inspection services to Southern Illinois University Carbondale. GCR compensates those state departments and Southern Illinois University Carbondale for all public-use airport inspections through the FAA's GCR grant (M. Romero, personal communication, Oct. 14, 2010).

Training for non-certificated airport inspection personnel is provided by GCR as part of the Airport Safety Data Collection Program. Under the terms of the FAA's GCR grant, GCR designs and arranges training seminars in FAA Form 5010-1 inspection procedures twice each year. The training program provides attendees with a basic knowledge of inspection requirements, such as identifying and amending data elements on FAA Form 5010, conducting obstruction analyses, uploading the inspection results to www.5010web.com, and many other airport inspection practices. It can be noted that www.5010web.com is a secure site and is designed to provide direct access to the Aeronautical Information Services (ATA-100) database. Through the site, both state and federal airport inspectors with an authorized username and password can review and edit all data for each airport in the ATA-100 database for which they have inspection authority (M. Romero, personal communication, Oct. 14, 2010).

States are provided with funding to inspect one-third of their airports every year. Each state receives a certain amount per airport, with Hawaii and Alaska receiving double compensation. If the states contractually agree to inspect their eligible airports, then the states receive the funding for each eligible airport. Rather than receiving funding in a lump sum, states receive funding after the results of each airport inspection are submitted to www.5010web.com. Most states agree to

inspect their airports, submit their inspection results, and collect their funds, but there are some exceptions to the norm. Some states opt out of the inspection process altogether. In these cases, a private contractor is hired to conduct the inspections. In other cases, states agree to conduct the inspections but fail to uphold their obligations. A private contractor is then hired to conduct the airport inspections, and the funding is diverted from the states and used to compensate the private inspector. Airports can be inspected by state airport inspectors or by private airport inspection contractors. By utilizing contract personnel, states are relieved of the financial obligations associated with employing one or more airport inspection personnel year-round (M. Romero, personal communication, Oct. 14, 2010).

To determine the degree of state oversight of airport self-inspection programs, each of the 50 state aviation agencies (typically in the form of a DOT) were surveyed. A total of 49 states responded, with some survey data verified by GCR. Currently, 43 states inspect non-certificated, public-use airports using state airport inspection personnel generally employed by state departments of aviation. Seven states currently elect to have airports in their state inspected by contractors rather than by state personnel. These numbers account for the state of Texas handling some airport inspections in-house and contracting out the inspection of others. Also, the state of Florida handles its own inspections, but does not participate in the 5010 program with GCR, uploading inspection data directly to the FAA. Table 6 shows the inspection practice by state.

Frequency of Inspection

When queried as to how often inspections are performed, the majority of states said they inspect either annually or triennially. Figure 45 presents the frequency with which states inspect airports.

Areas of Focus During an Inspection

Participating states were also queried as to what areas or practices were inspected during the state inspection. As seen in Figure 46, the most emphasis is placed on markings, signs, and lighting, as well as on obstructions, pavement areas, and safety areas. Interestingly, only 11% of states inspect training records during the state inspection.

Issuance of Licenses or Certificates

Additionally, 61% of states actually issue airport licenses or certificates. Of those that issue licenses, 85% require a successful inspection to obtain or renew the license. Finally, in 21% of states, a successful airport inspection is required to be eligible for state funding for airports. In 47% of states,

TABLE 6
STATES RESPONSIBLE FOR CONDUCTING INSPECTIONS
OF PUBLIC-USE AIRPORTS

State	State-Conducted Inspections	Contracted Inspections
Alaska	X	
Alabama	X	
Arkansas	X	
Arizona		X
California	X	
Colorado	X	
Connecticut	X	
Delaware	X	
Florida	X	
Georgia	X	
Hawaii	X	
Iowa	X	
Idaho	X	
Illinois	X	
Indiana	X	
Kansas	X	
Kentucky	X	
Louisiana	X	
Massachusetts	X	
Maryland	X	
Maine		X
Michigan	X	
Minnesota	X	
Missouri	X	
Mississippi	X	
Montana	X	
North Carolina	X	
Nebraska	X	
New Hampshire	X	
New Jersey	X	
New Mexico		X
Nevada	X	
New York	X	
Ohio	X	
Oklahoma	X	
Oregon	X	
Pennsylvania	X	
Rhode Island	X	
South Carolina	X	
South Dakota	X	

TABLE 6
(*continued*)

State	State-Conducted Inspections	Contracted Inspections
Tennessee	X	
Texas	X	X
Utah	X	
Virginia	X	
Vermont		X
Washington		X
Wisconsin	X	
West Virginia		X
Wyoming	X	

Source: Survey data, supplemented by GCR data.

state funding is contingent upon more than a successful inspection.

State Guidance

When queried whether their state had guidance for airports in preparing for a state inspection, 44% answered in the negative. When asked if their state had guidance for airports in developing self-inspection programs, 77% of states answered in the negative, although more than half of those states direct airports to the FAA for guidance.

Training Oversight

In the majority of states (51%), the training of personnel conducting airport self-inspections is an issue of importance.
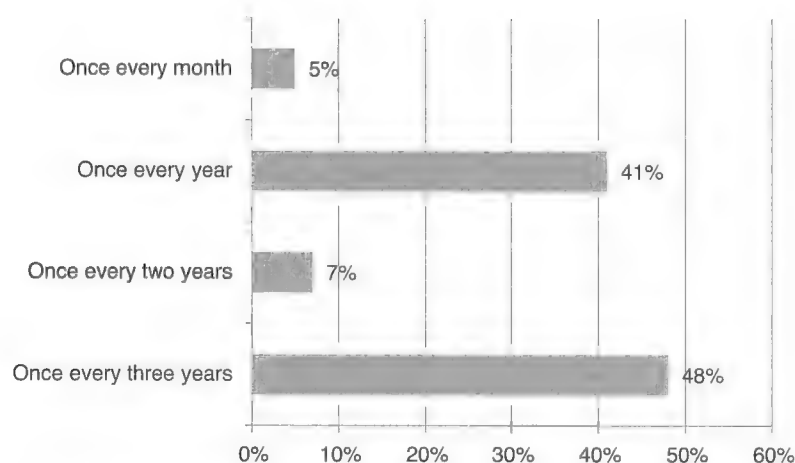
FIGURE 45 Frequency of state inspections.
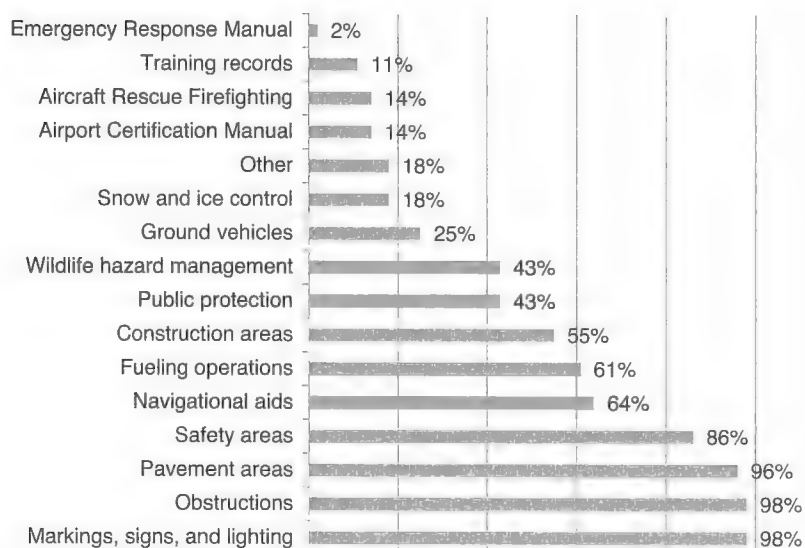
FIGURE 46 Areas/practices inspected during state inspection.

However, the majority of states (61%) indicated that training practices are not an area of inspection by the state. Further, 89% of states do not offer guidance to airports in developing training programs for their self-inspection personnel. However, 47% direct airports to the FAA for guidance.

Summary of State Oversight

Although practices vary to some degree among states, there are commonalities. Most airports inspected by state aviation agencies are non-certificated, public-use airports and are inspected either annually or once every 3 years. Although different areas may be inspected during a state inspection, the following areas are most common:

- Markings, signs, and lighting;
- Obstructions;
- Pavement areas; and
- Safety areas.

Finally, although some states offer guidance to airports in preparing for a state inspection, developing a self-inspection program, and training self-inspection personnel, many states direct airports to the FAA for guidance in these areas.

CHAPTER EIGHT

CONCLUSION

Before this synthesis was conducted, it was acknowledged by many in the industry that variation exists among airports in how they conduct self-inspections and train personnel to conduct those inspections. The oversight of these self-inspection programs among certificated and non-certificated airports was also acknowledged to be varied. Further, there was no readily available synthesis of current airport self-inspection procedures from which airport operators could review and improve upon their self-inspection programs. Thus, the purpose of this synthesis was to (1) present current airport self-inspection practices, including training procedures, and (2) present FAA and state aviation agency oversight practices.

Although the results of this synthesis continue to reveal variation among airports regarding their self-inspection program, general trends and common themes have been discovered.

TRAINING

Trends in training include the following:

- At most airports, self-inspection training is conducted by operations personnel.
- Initial training for self-inspection personnel is combined with other training at most airports, and typically consists of on-the-job training, self-study, and interactive training. Further, initial training is typically provided in-house.
- Recurrent training is typically conducted through on-the-job training, interactive training, self-study, videos, and tests. Further, recurrent training is generally provided in-house, although one-fourth of airports rely either exclusively or supplementarily on a private provider.
- Typically, initial training is conducted as needed when new personnel are hired, whereas recurrent training is conducted of all personnel on an annual basis.
- At most airports, operations personnel are the only employee group receiving all components of required Part 139 training. Further, personnel generally only receive training in their specific responsibilities as outlined in the Airport Certification Manual.
- Most airports do not require additional certification for personnel conducting self-inspections.

INSPECTING

Trends in inspecting include the following:

- Most airports conduct self-inspections by one person, visually, and in a vehicle.
- Most airports perform inspections during the night and during the day, vary inspection patterns, and inspect runways and taxiways in both directions.
- The tools or equipment most utilized by airports in conducting self-inspections are vehicles and paper self-inspection checklists.
- Typically, operations personnel are responsible for conducting self-inspections and maintaining Part 139 compliance.
- Most airports allow tenants to ride along on a self-inspection by request only.

REPORTING DISCREPANCIES AND FINDINGS

Trends in reporting discrepancies and findings include the following:

- In reporting information to air carriers, most airports rely on fax and e-mail, although some airports also post Notices to Airmen on the airport website or an intranet site to which air carriers have access.
- In reporting discrepancies to ensure prompt correction of unsafe conditions, most airports report urgent matters over the radio or phone and less urgent matters through e-mail or a work order system.

FOLLOW-UP, RESOLUTION, AND CLOSE-OUT

Trends in follow-up, resolution, and close-out include the following:

- Most airports use an electronic work order system with e-mail confirmation and face-to-face meetings to follow up on discrepancies and ensure their resolution.

QUALITY CONTROL

Trends in quality control include the following:

- To minimize complacency among inspection personnel, most airports rely on training, management oversight, and audits.

- To convey the importance of properly conducting self-inspections, most airports stress the FAA requirement for conducting self-inspections as well as the potential for liability and aircraft accidents if a self-inspection is not conducted properly.
- Complacency and fatigue are the two human factors having the most significant negative impact on airport self-inspection programs.

OVERSIGHT

Trends in oversight include the following:

- FAA airport certification safety inspectors maintain oversight of certificated airports and conduct certification inspections annually.
- Successful practices in self-inspections observed by FAA airport certification safety inspectors include multiple passes on the runway, both day and night inspections, periodically walking the pavement and safety areas, and adopting technology such as electronic work order systems and electronic checklists with geographic information systems mapping.
- Successful practices in training observed by FAA airport certification safety inspectors include FAA-generated PowerPoint presentations, hands-on training, mock Part 139 inspections, assigning areas of expertise to in-house personnel, industry training events, and visiting peer airports.
- State aviation agencies generally have oversight of non-certificated airports and conduct inspections annually, biennially, or triennially, depending on the state.
- Most states issue either an airport license or airport operating certificate.
- State aviation agencies generally have little guidance available for airports in developing a self-inspection program, preparing for an inspection, or training personnel. These state agencies generally direct airports to the FAA for guidance on these topics.
- During an inspection, state aviation agencies generally focus on the same areas of concern as the FAA, although markings, signs, lighting, obstructions, pavement areas, and safety areas receive the most attention.

In summary, this synthesis discovered that airport self-inspection programs range from low-tech to high-tech, and may be carried out by many individuals or a team of one. The techniques for conducting self-inspections, as well as training and ensuring quality control, not only vary among airports, but may vary among personnel at the same airport. There is, therefore, no "one best way" to conduct self-inspections or carry out a comprehensive self-inspection program. This is expected, as there are many ways an airport operator can comply with Part 139. That is the reason for guidance contained within AC 150/5200-18C, as well as why each certificated airport develops an Airport Certification Manual, detailing how that airport plans to comply with Part 139.

In the end, airport operators desiring to improve their self-inspection programs reported considering the following:

- Adopt technology and additional tools as appropriate;
- Visit peer airports to learn from their programs;
- Reach out to the FAA for additional guidance; and
- Focus on effective training and quality control.

As one FAA lead certification safety inspector stated, "Airports should consider the self-inspection program the key to FAR Part 139 compliance. Where there are deficiencies in the self-inspection program, we see systemic breakdowns in Part 139 compliance."

FURTHER RESEARCH

Although this report provides information on the training of self-inspection personnel, more research could be helpful in this area. For instance, how many employees are considered to have duties under Part 139 and are trained, and from which departments, in Part 139? What is the magnitude of the training? Also meriting further research are the follow-up and close-out processes. More insight into how airports handle these issues would be beneficial.

ACRONYMS

AC	Advisory Circular	GCR	GCR & Associates, Inc.
ACM	Airport Certification Manual	GIS	Geographic information system
AOA	Aircraft Operating Area	GPS	Global Positioning System
AOC	Airport Operating Certificate	IATA	International Air Transport Association
ARFF	Aircraft Rescue and Firefighting	IET	Interactive Employee Training
ATCT	Airport Traffic Control Tower	NAVAIDS	Navigational Aids
CFR	Code of Federal Regulations	NOTAM	Notice to Airmen
CTAF	Common Traffic Advisory Frequency	PPE	Personal Protective Equipment
DOT	Department of transportation	QC	Quality control
FOD	Foreign object debris	SA	Situational awareness
GA	General aviation	SIUC	Southern Illinois University Carbondale

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APPENDIX A

Participating Airports

Akron-Canton (OH) Airport (CAK)	Davenport (IA) Municipal Airport (DVN)	Philadelphia (PA) International Airport (PHL)
Albuquerque (NM) International Sunport Airport (ABQ)	Fort Lauderdale-Hollywood (FL) International Airport (FLL)	St. Cloud (MN) Regional Airport (STC)
Asheville (NC) Regional Airport (AVL)	Gulfport-Biloxi (MS) International Airport (GPT)	Salt Lake City (UT) International Airport (SLC)
Baltimore/Washington (MD) International Thurgood Marshall Airport (BWI)	John F. Kennedy (NY) International Airport (JFK)	San Francisco (CA) International Airport (SFO)
Bangor (ME) International Airport (BGR)	Juneau (AK) International Airport (JNU)	Spokane (WA) International Airport (GEG)
Birmingham–Shuttlesworth (AL) International Airport (BHM)	Kansas City (MO) International Airport (MCI)	State of Alaska Department of Transportation
Boston Logan (MA) International Airport (BOS)	Louis Armstrong New Orleans (LA) International Airport (MSY)	State of Utah Aeronautics
Bradley (CT) International Airport (BDL)	Mena (AR) Intermountain Municipal Airport (MEZ)	Tampa International Airport (TPA)
Casper/Natrona County (WY) International Airport (CPR)	Minneapolis-St. Paul International Airport (MSP)	Virginia Department of Aviation
Cherry Capital Airport (MI) (TVC)	Oakland (CA) International Airport (OAK)	
Chicago O'Hare (IL) International Airport (ORD)		

Note: Three airports did not specify.

APPENDIX B

Participating FAA Regions

Alaskan	Great Lakes	Southwest
Central	Southern	Western Pacific
Eastern		

APPENDIX C

Participating State Aviation Agencies

Alabama	Louisiana	Ohio
Alaska	Maine	Oklahoma
Arizona	Maryland	Oregon
Arkansas	Massachusetts	Pennsylvania
California	Michigan	Rhode Island
Colorado	Minnesota	South Carolina
Connecticut	Mississippi	South Dakota
Delaware	Missouri	Tennessee
Florida	Montana	Texas
Georgia	Nebraska	Utah
Hawaii	Nevada	Vermont
Idaho	New Hampshire	Virginia
Illinois	New Jersey	Washington
Indiana	New York	West Virginia
Iowa	North Carolina	Wisconsin
Kansas	North Dakota	Wyoming
Kentucky		

APPENDIX D

Airport Survey of Self-Inspection Practices & Training Questionnaire

Airport Survey of Self Inspection Practices & Training (P2)

Your airport has been selected to participate in an important national synthesis of <u>Current Airport Self-Inspection Practices and Training</u>. This project, which is funded by the National Academies as part of the Transportation Research Board's Airport Cooperative Research Program, is designed to collect data regarding airport self-inspection practices. Your participation is extremely important as we strive for at least an 80 percent response rate. Please note that we plan to follow-up with non-respondents to ensure a satisfactory response rate.

Although your responses will remain confidential, the researcher is able to correlate responses to your name and email address for the sole purpose of ensuring the adequacy and integrity of responses. Final data will be reported in aggregate and your airport will only be identified as a possible case example of best practices, if you so authorize. If you choose to participate, you are free to withdraw from the study at any time without consequence or penalty.

The survey should take 15-20 minutes of your time. By clicking next, you agree to participate. Any follow-up emails or calls will be to help clarify a response, respond to any questions, and to help us achieve the required 80 percent response rate.

Note: <u>This survey refers to an entire airport self-inspection program, to include pavement areas, safety areas, markings, signs, lighting, ARFF, fueling, NAVAIDs, ground vehicles, obstructions, public protection, wildlife, construction, and snow and ice control.</u>

1. What self-inspection method(s) does your airport use? Select all that apply.

☐ By one person

☐ In teams

☐ Visual

☐ While in vehicle

☐ Walks

☐ Other (please specify)

2. Please share the reasons why your airport chose these various inspection methods.

Airport Survey of Self Inspection Practices & Training (P2)

3. What self-inspection <u>techniques</u> does your airport use? Select all that apply.

☐ Fixed inspection pattern

☐ Varied inspection pattern

☐ Inspect toward direction of landing aircraft

☐ Inspect runway(s) in both directions

☐ Inspect taxiway(s) in both directions

☐ Inspect stub taxiways between runway and parallel taxiway

☐ Inspect during the night

☐ Inspect during the day

4. Please share the reasons why your airport chose these various inspection techniques.

[text box]

5. What <u>equipment or tools</u> does your airport use when conducting self inspections? Select all that apply.

☐ Hand-held device (i.e., PDA)

☐ Vehicle mounted device (i.e., Tablet PC, etc.)

☐ Imagery (i.e., FLIR, etc.)

☐ Vehicles

☐ Friction tester

☐ Paper self-inspection checklist

☐ Paper self-inspection checklist with airport diagram

☐ Other (please specify)

[text box]

6. Please share the reasons why your airport chose these various types of equipment/tools.

[text box]

Airport Survey of Self Inspection Practices & Training (P2)

7. Of the total inspections conducted at your airport annually, please specify the percentage of each type of inspection conducted:

Regularly scheduled inspections (Daily inspection required by Part 139)

Continuous surveillance inspections (such as fueling, construction, maintenance)

Periodic condition inspections (such as surveying approach slopes, obstructions, etc.)

Special inspections (during unusual conditions such as changing weather)

8. What personnel at your airport are responsible for:

	Airport manager	Operations personnel	ARFF personnel	Maintenance personnel	Police/Security Personnel	Contract company
Conducting self-inspections	☐	☐	☐	☐	☐	☐
Maintaining Part 139 Compliance	☐	☐	☐	☐	☐	☐

Other (please specify)

Airport Survey of Self Inspection Practices & Training (P2)

9. Which of the following personnel are responsible for inspecting each of the following areas at your airport?

	Airport operations personnel	Airport maintenance personnel	Airport security personnel	Air carriers	FBO	Other tenants
Pavement areas	☐	☐	☐	☐	☐	☐
Safety areas	☐	☐	☐	☐	☐	☐
Markings and signs	☐	☐	☐	☐	☐	☐
Lighting	☐	☐	☐	☐	☐	☐
ARFF	☐	☐	☐	☐	☐	☐
Fueling operations	☐	☐	☐	☐	☐	☐
Navigational aids	☐	☐	☐	☐	☐	☐
Ground vehicles	☐	☐	☐	☐	☐	☐
Obstructions	☐	☐	☐	☐	☐	☐
Public protection	☐	☐	☐	☐	☐	☐
Wildlife hazard management	☐	☐	☐	☐	☐	☐
Construction	☐	☐	☐	☐	☐	☐
Snow and ice control	☐	☐	☐	☐	☐	☐

10. Does your airport allow tenant personnel (i.e., FBO line supervisor, airline station manager) to ride along on airport self inspections?

◯ Yes-daily

◯ Occasionally

◯ By request only

◯ No

11. FAR Part 139.327 specifies the schedule for self-inspections (daily, when required by any unusual activity, & immediately after an accident or incident). How does your ACM compare to FAR Part 139.327?

◯ Complies

◯ Not required (my airport does not hold a 139 operating certificate)

◯ Does not comply (Part 139 Airport)

◯ Goes above and beyond

[   ]

Airport Survey of Self Inspection Practices & Training (P2)

12. Who conducts self-inspection <u>training</u> at your airport? Select all that apply.

☐ Airport manager

☐ Training manager

☐ Operations personnel

☐ Interactive Employee Training (IET) system

☐ Varies

☐ Other (please specify)

[   ]

13. What is the duration of initial training for self inspectors at your airport prior to being given self inspection authority? Select all that apply.

☐ Less than one hour

☐ One to five hours

☐ More than five hours

☐ Combined with other training

☐ Other (please specify)

[   ]

14. How often is self inspection training conducted at your airport?

	Daily	Weekly	Monthly	Bi-monthly	Quarterly	Annually	As needed, when new employees are hired
<u>Initial</u> training	○	○	○	○	○	○	○
<u>Recurrent</u> training	○	○	○	○	○	○	○

Other (please specify)

[   ]

Airport Survey of Self Inspection Practices & Training (P2)

15. At your airport, which of the following employee groups receive all components of required CFR Part 139 training? Select all that apply.

☐ Operations personnel

☐ ARFF personnel

☐ Maintenance personnel

☐ Police

☐ Other (please specify)

[   ]

16. At your airport, do employees only receive training with regard to their specific responsibilities identified in the airport's Airport Certification Manual?

◯ Yes

◯ No

17. Are additional certifications (i.e, C.M., ACE, A.A.E.) required at your airport by personnel conducting self-inspections?

◯ Yes

◯ No

◯ Strongly encouraged, but not required

18. What self-inspection _initial_ training method(s) does your airport use? Select all that apply.

☐ Self Study

☐ On-the-job training

☐ Interactive Training

☐ Conferences/Workshops

☐ Video

☐ Tests

☐ Other (please specify)

[   ]

66

19. Please share the reasons why your airport chose these <u>initial</u> training methods.

```
┌─────────────────────────────────────────────┐
│                                             │
│                                             │
│                                             │
└─────────────────────────────────────────────┘
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20. Is this <u>initial</u> training provided in-house or from a private provider? Select all that apply.

☐ In-house

☐ Private provider

Name of private provider

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┌──────────────────────────┐
│                          │
└──────────────────────────┘
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21. What self-inspection <u>recurrent</u> training method(s) does your airport use? Select all that apply.

☐ Self Study

☐ On-the-job training

☐ Interactive Training

☐ Conferences/Workshops

☐ Video

☐ Tests

22. Please share the reasons why your airport chose these <u>recurrent</u> training methods.

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┌─────────────────────────────────────────────┐
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│                                             │
│                                             │
└─────────────────────────────────────────────┘
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23. Is this <u>recurrent</u> training provided in-house or from a private provider? Select all that apply.

☐ In-house

☐ Private Provider

Name of private provider

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┌──────────────────────────┐
│                          │
└──────────────────────────┘
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Airport Survey of Self Inspection Practices & Training (P2)

24. CFR Part 139.327 requires "procedures, facilities, and equipment for reliable and rapid dissemination of information between the certificate holder's personnel and air carriers." Please explain how this is accomplished at your airport.

25. FAR Part 139.327 also requires "a reporting system to ensure prompt correction of unsafe airport conditions noted during the inspection." Please explain how this is accomplished at your airport.

26. What method(s) does your airport use to follow-up on discrepancies and ensure their resolution? Select all that apply.

- [ ] Electronic work order system
- [ ] Paper work order system
- [ ] Maintenance briefings
- [ ] Email confirmation
- [ ] Phone call confirmation
- [ ] Face to face
- [ ] Other (please specify)

27. In what manner are items reported on the self-inspection properly closed out?

28. At what point is an issue (discrepancy) considered close-out?

Airport Survey of Self Inspection Practices & Training (P2)

29. Which of the following method(s) does your airport use to minimize complacency among personnel conducting self inspections? Select all that apply.

- ☐ Audits
- ☐ Training
- ☐ Require varying inspection routes
- ☐ Management oversight
- ☐ Employee turnover
- ☐ Promotion/Awareness programs
- ☐ Other (please specify)

30. Which of the following reasons do you use in conveying the importance of inspections? Select all that apply.

- ☐ Potential Liability
- ☐ FAA Requirement
- ☐ Potential Penalties
- ☐ Potential Aircraft Accidents
- ☐ Other (please specify)

31. How does your airport ensure quality control concerning the self inspection process (to include training, inspecting, documenting)?

Airport Survey of Self Inspection Practices & Training (P2)

32. Please specify the degree to which each of the following factors negatively impacts your self-inspection personnel and their ability to carry out your airport's self inspection program.

	Significant impact	Some impact	Little impact	No impact
Complacency	○	○	○	○
Fatigue	○	○	○	○
Noise/Distractions	○	○	○	○
Inadequately trained	○	○	○	○
Lack of awareness	○	○	○	○
Lacking confidence	○	○	○	○
Inadequate time to carry-out inspection	○	○	○	○
Overconfident	○	○	○	○

33. In what FAA region is your airport located?

○ Alaska

○ Central

○ Eastern

○ Great Lakes

○ New England

○ Northwest Mountain

○ Southern

○ Southwestern

○ Western Pacific

34. How is your airport categorized?

○ Large hub (at least 1% of total U.S. passenger enplanements)

○ Medium hub (between 0.25 and 1% of total U.S. passenger enplanements)

○ Small hub (between 0.05 and 0.25% of total U.S. passenger enplanements)

○ Non-hub (less than 0.05%, but more than 10,000 enplanements)

○ Nonprimary (from 2,500 to 10,000 annual passenger enplanements)

○ General Aviation

○ Military

Airport Survey of Self Inspection Practices & Training (P2)

35. How many annual aircraft operations were conducted at your airport for CY2009?

◯ Less than 10,000

◯ 10,001-30,000

◯ 30,001-70,000

◯ 70,001-100,000

◯ 100,001-150,000

◯ 150,001-200,000

◯ 200,001-300,000

◯ Greater than 300,000

36. In what manner is your airport certificated?

◯ 14CFR Part 139 - Class I

◯ 14CFR Part 139 - Class II

◯ 14CFR Part 139 - Class III

◯ 14CFR Part 139 - Class IV

◯ Not certficated

37. Does your state department of transportation/aeronautics inspect your airport annually?
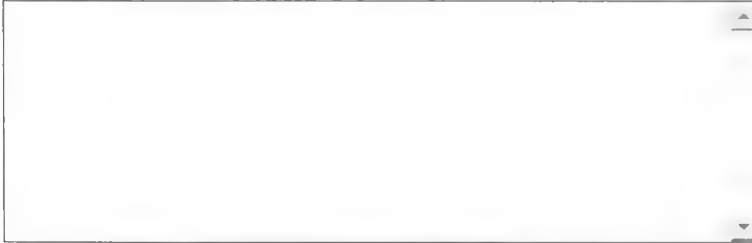
◯ No

◯ Yes (specify state)

[_____]

38. Are you willing to allow your airport's name to appear in the final Synthesis Report as a case study?

☐ No

☐ Yes (Airport Name)

[_____]

Airport Survey of Self Inspection Practices & Training (P2)

39. If you would like to share any additional information regarding your self-inspection program (including procedures and training practices), please do so below.

40. Do you have an inspection checklist (DSI or continuous surveillance, periodic, or special inspection checklist), example of logs, work order, training records, etc. that you would be willing to share? Our final report will include examples of these various forms.

◯ No

◯ Yes-please email to dprather@pratherairportsolutions.com

Thank you for your time and effort in completing this survey. Your responses regarding airport inspection practices will provide great insight into this topic and will strengthen the synthesis of information on this topic. If you have any questions regarding the survey, please contact Dr. Daniel Prather at dprather@pratherairportsolutions.com or 615-663-5570. You can mail any documentation that you feel might be helpful to this study to the following address. Thank you.

Dr. C. Daniel Prather, A.A.E.
Prather Airport Solutions, Inc.
425 North Thompson Lane, Ste #38
Murfreesboro, TN 37129

APPENDIX E

Survey of FAA Certification Inspection Practices Questionnaire

Survey of FAA Certification Inspection Practices (P2)

1. Intro & Consent

As an FAA airport certification inspector, you have been selected from your region to participate in an important national synthesis of Current Airport Self-Inspection Practices and Training. This project, which is funded by the National Academies as part of the Transportation Research Board's Airport Cooperative Research Program, is designed to gather data regarding the manner by which airports carry-out airport self-inspections and train personnel to conduct inspections. We are also interested in FAA oversight of airport self-inspection practices and training.

Your participation is extremely important as we strive for at least an 80 percent response rate. Please note that we plan to follow-up with non-respondents to ensure a satisfactory response rate. Although your responses will remain confidential, the researcher is able to correlate responses to your name and email address for the sole purpose of ensuring the adequacy and integrity of responses. Final data will be reported in aggregate and your name will not be identified. However, we may compare findings on a regional basis in our final report. Your participation is voluntary. If you choose to participate, you are free to withdraw from the study at any time without consequence or penalty.

The survey should take no more than 15 minutes of your time. By clicking next, you agree to participate. Any follow-up emails or calls will be to help clarify a response, respond to any questions, and to help us achieve the required 80 percent response rate.

1. Are there any Cert Alerts that have been issued by your office covering airport self-inspections and/or training of personnel responsible for conducting self-inspections?

◯ No
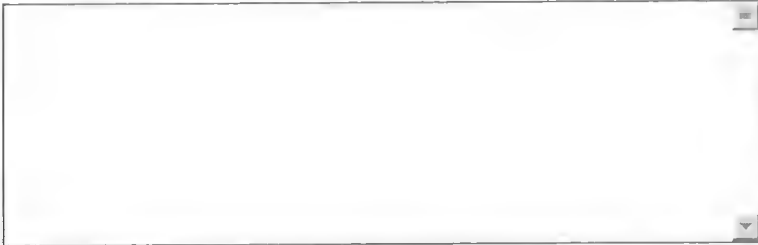
◯ Yes (please specify)

2. Based on your knowledge of Part 139 airports in your region, what are some of the best self-inspection practices you have discovered?

Survey of FAA Certification Inspection Practices (P2)

3. Based on your knowledge of Part 139 airports in your region, what are some of the best practices for <u>training</u> self-inspection personnel you've discovered?

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3.
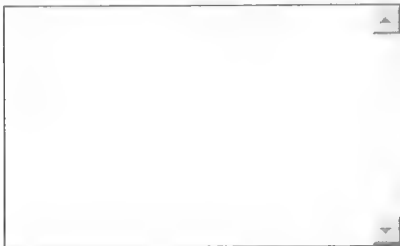
1. In what manner, if any, does your region's expectations differ from 14 CFR Part 139.303 and 139.327?

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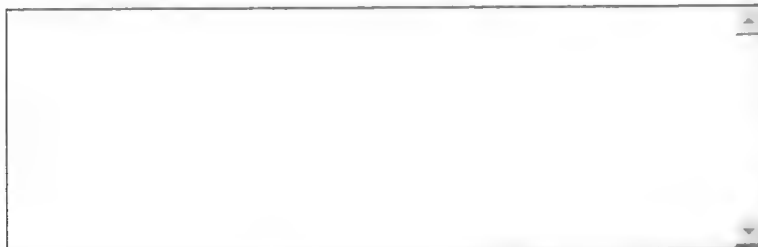
2. Does your FAA region have specific guidance for airports in conducting self-inspections or training of personnel to conduct these inspections?

○ No

○ Yes (please specify)

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3. Specifically, how can airports strengthen their self-inspection program, to include training of personnel conducting self-inspections?

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Survey of FAA Certification Inspection Practices (P2)

4. Please share any additional information regarding self-inspections, training personnel to conduct self-inspections, and your office's oversight of these.

4. Thank you

Thank you for your time and effort in completing this survey. Your responses regarding airport inspection practices and FAA oversight will provide great insight into this topic and will strengthen the synthesis of information on this topic.
If you have any questions regarding the survey, please contact Dr. Daniel Prather at dprather@pratherairportsolutions.com or 615-663-5570. You can mail any documentation that you feel might be helpful to this study to the following address. Thank you.

Dr. C. Daniel Prather, A.A.E.
Prather Airport Solutions, Inc.
425 North Thompson Lane, Ste #38
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APPENDIX F

Airport Oversight by State Aviation Agencies Survey

Airport Oversight by State Aviation Agencies

1. Intro & Consent

As a representative of a state aviation agency, you have been selected from your state to participate in an important national synthesis of Current Airport Self-Inspection Practices and Training. This project, which is funded by the National Academies as part of the Transportation Research Board's Airport Cooperative Research Program, is designed to gather data regarding the manner by which airports carry-out airport self-inspections and train personnel to conduct inspections. We are also interested in state oversight of airport self-inspection practices and training.

Your participation is extremely important as we strive for at least an 80 percent response rate. Please note that we plan to follow-up with non-respondents to ensure a satisfactory response rate. Although your name will not be tied to any specific responses and will be kept confidential, we do plan to show results on a state-by state basis in the final report. Further, the researcher is able to correlate responses to your name and email address for the sole purpose of ensuring the adequacy and integrity of responses. Your participation is voluntary. If you choose to participate, you are free to withdraw from the study at any time without consequence or penalty.

The survey should take no more than 10 minutes of your time. By clicking next, you agree to participate. Please respond by Friday, October 8. Any follow-up emails or calls will be to help clarify a response, respond to any questions, and to help us achieve the required 80 percent response rate.

1. Is your office (or department/division) responsible for inspecting public-use airports throughout your state (whether 139 or non-139)?

○ Yes

○ No

1. Which airports are inspected by your state aviation agency?

○ Part 139 certificated

○ Non-Part 139 certificated

○ All public use airports

○ All public and private use airports

Airport Oversight by State Aviation Agencies

2. How often are your state inspections performed?

◯ Monthly

◯ Bimonthly

◯ Quarterly

◯ Biannually

◯ Annually

◯ Biennially

◯ Other (please specify)

[   ]

3. What areas/practices are inspected during the state inspection?

☐ ACM

☐ ARFF

☐ Construction areas

☐ ERM

☐ Fueling operations

☐ Ground vehicles

☐ Markings, signs, lighting

☐ Navigational aids

☐ Obstructions

☐ Pavement areas

☐ Public protection

☐ Safety areas

☐ Snow and ice control

☐ Training records

☐ Wildlife hazard management

☐ Other (please specify)

[   ]

Airport Oversight by State Aviation Agencies

4. Does your state issue airport licenses/certificates?

◯ Yes

◯ No

---

1. Is the issuance (or renewal) of an airport operating certificate contingent upon a successful inspection by your office?

◯ Yes

◯ No

---

1. Is a successful airport inspection by your office required to be eligible for any state funding for airports?

◯ Yes

◯ No

◯ Depends

2. Does your state have guidance for airports <u>preparing for a state inspection</u>? If so, please either provide the web address or email to dprather@pratherairportsolutions.com

◯ Yes (I'll email)

◯ Yes (But, I choose not to share)

◯ No (We direct them to the FAA)

◯ No

◯ Yes (I'll provide web address of documents)

[   ]

Airport Oversight by State Aviation Agencies

3. Does your state have guidance for airports <u>developing self-inspection programs</u>? If so, please either provide the web address or email to dprather@pratherairportsolutions.com

( ) Yes (I'll email information)

( ) Yes (But, I choose not to share)

( ) No

( ) No (We direct them to the FAA)

( ) Yes (I'll provide web address of documents)

[   ]

4. Is your state concerned with the training of personnel conducting airport self-inspections?

( ) Yes

( ) No

6.

1. To what degree are training practices a part of an inspection by your office?

( ) Main focus

( ) Equal in focus as other areas we examine

( ) An afterthought

( ) Not an area of our inspection

7.

1. Does your state have guidance for airports developing training programs for their self-inspection personnel? If so, please either provide the web address or email to dprather@pratherairportsolutions.com

( ) Yes (I'll email information)

( ) Yes (But, I choose not to share)

( ) No

( ) No (We direct them to the FAA)

( ) Yes (I'll provide web address of documents)

[   ]

Airport Oversight by State Aviation Agencies

8. Demographics

1. Which of the following states do you represent?

◯ ALABAMA	◯ LOUISIANA	◯ OKLAHOMA
◯ ALASKA	◯ MAINE	◯ OREGON
◯ ARIZONA	◯ MARYLAND	◯ PENNSYLVANIA
◯ ARKANSAS	◯ MASSACHUSETTS	◯ PUERTO RICO
◯ CALIFORNIA	◯ MICHIGAN	◯ RHODE ISLAND
◯ COLORADO	◯ MINNESOTA	◯ SOUTH CAROLINA
◯ CONNECTICUT	◯ MISSISSIPPI	◯ SOUTH DAKOTA
◯ DELAWARE	◯ MISSOURI	◯ TENNESSEE
◯ DISTRICT OF COLUMBIA	◯ MONTANA	◯ TEXAS
◯ FLORIDA	◯ NEBRASKA	◯ UTAH
◯ GEORGIA	◯ NEVADA	◯ VERMONT
◯ HAWAII	◯ NEW HAMPSHIRE	◯ VIRGINIA
◯ IDAHO	◯ NEW JERSEY	◯ WASHINGTON
◯ ILLINOIS	◯ NEW MEXICO	◯ WEST VIRGINIA
◯ INDIANA	◯ NEW YORK	◯ WISCONSIN
◯ IOWA	◯ NORTH CAROLINA	◯ WYOMING
◯ KANSAS	◯ NORTH DAKOTA	
◯ KENTUCKY	◯ OHIO	

2. How many airports is your state responsible for inspecting?

◯ Zero

◯ Less than 10

◯ 11-30

◯ 31-50

◯ 51-70

◯ 71-90

◯ 91-110

◯ 111-130

◯ More than 130

Airport Oversight by State Aviation Agencies

9. Thank you!

Thank you for your time and effort in completing this survey. Your responses regarding airport inspection practices and state oversight will provide great insight into this topic and will strengthen the synthesis of information on this topic. If you have any questions regarding the survey, please contact Dr. Daniel Prather at dprather@pratherairportsolutions.com or 615-663-5570. You can mail any documentation that you feel might be helpful to this study to the following address. Thank you.

Dr. C. Daniel Prather, A.A.E.
Prather Airport Solutions, Inc.
425 North Thompson Lane, Ste #38
Murfreesboro, TN 37129

APPENDIX G

Open-Ended Responses by Airports

CHAPTER 2—TRAINING

Please share the reasons why your airport chose these <u>initial</u> training methods.

We have limited resources and we use what we can. We also like to change the training routine in order to keep it interesting.
They have proven reliable over a period of time and they are implementable at a relatively low cost.
After their initial training, the new employee continues their training by going on ride alongs with senior ops personnel before they are signed off and conduct the tests alone.
KISS method
Cost is low
Cost effective and has proven to work over a period of time.
These are the most effective methods that we find to adequately train operations personnel.
Good specific training for our airport.
Cost of interactive training is prohibitive and of limited value in teaching self-inspection. Hands-on or on-the-job training has proven most effective.
To cover everything.
Cheap, easy and effective.
We use computer based training (CBT) reinforced with on-the-job training. CBT provides quality control and allows a large number of employee to complete the training annually.
Have proven effective in past.
Cost factors
The above is a place to start. On the job training validates whether or not an employee understands what is going on.
Shift manager hires from within.
Cross blend of learning methods.
We will utilize all subject matter and materials available locally and on the internet to aid in initial training. We want to ensure training curriculum is qualitative, accurate and up to date so we also will use AAAE and ANTN programs and videos, FAA brochures, training materials & tests to supplement airport specific training, procedures and compliance requirements.
By using several different methods of training, we find it is more informative.
Encourage Basic and Advanced ASOS.
We believe a combination of different types of training works best.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

Please share the reasons why your airport chose these <u>recurrent</u> training methods.

These methods have proven reliable over time. We feel that once the person has proven him or herself we are comfortable with investing a little more in the employee and will send them to training or a conference off site.
Annually we take a test combined with a video to comply with 139.
Costs
Cost effective and has proven effective over time. We try to send employees to the AAAE Advanced ASOS course after about one year of employment.
Good specific training for our airport.
Keep it new if at all possible. Make sure we cover what is required.
Cheap, easy and effective.
Computer based training allows the Operations department to conduct recurrent training for a large number of Airport employees.
Actually, recurrent training is provided in a classroom setting.
Proven effective in past.
Ease of tracking and reduced staffing requirements.
Validating whether or not all has been retained.
Comprehensive
Cross blend of learning methods.
We will utilize all subject matter and materials available locally and on the internet to aid in training. We want to ensure training curriculum is qualitative, accurate and up to date so we also will use AAAE and ANTN programs and videos, FAA brochures, training materials & tests to supplement airport specific training, procedures and compliance requirements.
Same as new employees.
One conference per year.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

CHAPTER 3—INSPECTING

Please share the reasons why your airport chose these various inspection methods.

We have small certificated airports where the staff does everything. Hence, self-inspection methods are completed as is practical for that day. When inspections are done in teams, what I mean is that an individual may take input from another in completing the self-inspection.
It has resulted in a proven success rate over time.
Our Airport Certification Manual states we will perform 3 inspections per day. Seldom does more than one person do the runway inspection. Two people will go when staff permits, necessary to maintain safety or for training. Rarely do we walk the runways.
We have a small staff and inspections can be accomplished in a more timely manner this way.
We use all the tools possible.
The state owns only one airport. It's a small, paved, non-attended airport. It's a very simple airport to inspect.
At our airport, self-inspection of the airfield is responsibility of Airport Operations Department. Depending on manpower, the inspection is conducted by either one individual or a team of two. The only effective way to inspect a facility of our size is via vehicle.

Over time these methods have proven useful and we have a good track record.
Each shift performs portions of the inspection.
A variety of inspection methods are used depending on the area of assessment.
Inspections are done twice a day by the Airport Duty Manager who is responsible for the inspection.
35 years of experience says this is the way to do it.
Size of the facility and available resources.
Required.
Made the most sense, accomplished the task and meets regulatory requirements.
Part 139 self-inspections are a team effort. Operations personnel complete a portion of the inspection during each operational period (day, swing and midnight). Dividing the daily self-inspection over multiple shifts ensures all areas are inspected by multiple individuals. If an issue is missed by one inspector it is likely to be caught by the next.
Most inspections are performed from a vehicle.
They are effective and, most importantly, satisfy the criteria of part 139.
So that anyone who is driving on the airfield will know when items need to be corrected.
Vehicle inspection used for efficiency. Team approach while in vehicle to aid in ability to spot issues. Walks are done periodically to add a more thorough aspect.
Practicality.
All we have at our disposal at this time.
Staffing considerations and sheer size of the task.
It was the way I was taught 30 years ago. It's the way I teach all my rookies.
Our self-inspections are performed during dark hours. Less traffic and all of the lighting can be inspected.
The reason is that there are 8000+ acres of areas to be inspected. That includes runways, taxiways, taxi lanes, ramps, gates, etc. Each shift inspects different areas at different times. Also when bird strikes are reported or noticed, when an incursion occurs, and when abnormal circumstances are viewed or reported.
Multiple people will see more objects and discrepancies than one.
Broadest coverage for significant volume or body of work, redundancy, etc.
Best overall coverage of the airfield.
While one person is designated each shift to ensure required daily inspections are conducted, we utilize two individuals/vehicles to inspect our main air carrier runway. Two sets of eyes ensure the entire runway surface is visually inspected. We also walk safety areas when runways are closed to thoroughly inspect areas that may otherwise be missed when driving in a vehicle. We also will split areas of the airfield into units and assign individuals to concentrate on markings, lighting, pavement, safety areas, etc., to ensure a thorough inspection is conducted.
Public Safety does our inspections. For security and safety, they are 24 hour with several inspections
It is what works best for us.
3 times each day before first flight, evening, and noon
We have a limited number of employees and need to use a vehicle to get the self-inspection completed in a timely manner.
There are several items that are inspected at regularly scheduled and spontaneous times -- therefore, the difference in methods.
Everything must be checked from multiple angles to insure compliance.
Our airport has 3 runways around 10,000 ft. and associated taxiways. Using a vehicle to inspect these surfaces is the most practical method.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

Please share the reasons why your airport chose these various inspection techniques.

I have five airports with five airport managers. They all use the same checklist but have different techniques on how they inspect. For the most part, they follow their own fixed inspection pattern and they do the checks before the passenger jet arrives. Due to our northern latitude, night inspections are done less often in the summer and more often in the winter. In the summer, lights are checked by day.
We inspect toward the direction of landing aircraft for safety reasons.
Typically we inspect in the direction of landing traffic although we may go against traffic. Because many individuals do the inspections, the pattern varies and many of us vary our own pattern to avoid complacency. Day and night inspections are required.
Enables a more complete inspection.
Use of the AC and to avoid complacency.
I tend to inspect in a fixed pattern and only drive in both directions if I'm doing a special detailed inspection, which is not that often. Inspections during the night rarely happen.
The state owns only one airport. It's a small, paved, non-attended airport. It's a very simple airport to inspect. Inspect during the night for airport beacon, runway lighting.
Each duty operations manager has a choice on how he or she inspects the airfield; thus, pattern would be different from one individual to the next. Each is required to inspect all areas of the AOA and a varied approach works best by seeing the pavement in different directions. Runway inspections are toward the direction of landing traffic, as specified in the letter of agreement with the FAA, for safety reasons.
We inspect runways toward the direction of landing traffic for safety reasons.
We work with ATCT to provide the best inspections without interrupting air traffic.
Because of the various types of equipment, including signs and in-pavement lighting, inspection from both directions is necessary to ensure equipment is working properly.
You get to see both sides of the signs this way. You get to see the possible landing traffic.
Flexibility.
Operations personnel inspect all runway and taxiways as part of the daily inspection. The frequency of aircraft operations often determines the direction of travel during an inspection. Lighting inspections are often performed in the direction of landing traffic to facilitate the inspection of runway lights (i.e., TDZs, PAPIs). During peak periods, a single pass is performed. During early morning hours it is possible to perform multiple passes on a runway.
They are effective and, most importantly, satisfy the criteria of part 139. Inspections vary every day. They vary in the route driven, the inspector, and possibly the time of the day the inspections are conducted.
To vary the inspection and to keep standards of inspection. This method allows us to see items that may otherwise get overlooked.
While the routine procedure is to follow a relatively set pattern, this approach is varied depending on traffic, availability of the airfield and starting point of the inspection.
The runways are inspected during the day in one direction only (with traffic or against) unless there is cause for a more detailed inspection- such as a pilot report of something on the runway and we must make several passes to find it. At night, the runways are inspected with three sweeps. This is possible because of lighter traffic. Also, the layout of our movement areas makes it practical to conduct two sweeps on one of our widest taxiways.
Much easier to teach rookies by routine and less likely to miss anything, but that is my opinion.
Old habits.
We are the eyes and ears of the airport and strive to provide a safe airport.
The reasons are air traffic flows, availability of areas to be inspected, etc. Special daylight inspections are coordinated with ATCT on a weekly basis
Consistency.
To cover all areas under varied conditions and not miss or lose sight of smaller less observant elements. Also, while runway inspections in landing direction are good safety practice, they are not specific to our method or routine for inspection.

We always attempt to stick to a fixed pattern to ensure all pavement and safety areas are inspected. If/when an inspection is interrupted, we know what was completed and where we need to start it back up. For runway safety, we always conduct runway inspections towards landing traffic, except after an emergency landing. We follow behind any landing aircraft that has declared an emergency to inspect the runway for FOD or other contaminants. We inspect taxiway full strength and shoulders (paved and unpaved) which requires driving both sides full length.

To provide full inspection.

Because of the width of our runway, we make 3 passes each way including safety areas. Night inspections, we make 2 passes each way.

Works well in coordination with tower--before first flight, midday and at night.

Four during the day, one at night.

We inspect into landing traffic as much as possible, but not always. This depends upon time.

According to need and regulations.

Everything must be checked from multiple angles to ensure compliance.

Our inspection techniques are varied due to the volume of air traffic during inspection.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

Please share the reasons why your airport chose these various types of equipment/tools.

Our airports are small and it is not always practical to invest in state of the art technology. We do use infrared surface condition temperature sensors as part of our snow and ice control program.

It has resulted in a proven success rate over time. We determined that based on the frequency of operations, frequent friction testing was required.

We use the paper self-inspection checklist. A friction tester is used every month to measure rubber build up.

KISS method.

Equipment is based on money. I'm sure the airports with more money probably have the capability to spend more on inspection equipment. We don't have a lot of money to spend.

The state owns only one airport. It's a small, paved, non-attended airport. It's a very simple airport to inspect.

As stated earlier, vehicles must be used for efficiency reasons. Friction is done twice a year to measure rubber build up and the removal process. For documentation purposes, we still find the paper checklist as the most useable; however as mentioned, we are looking to incorporate self-inspection process with a GIS capable Tablet.

Over time these methods have proven useful and we have a good track record. We recently added a friction tester to our inventory when we realized that the number of operations constituted the need for more frequent friction tests.

We try to use the appropriate tools for the inspection at hand.

Useable by all Airport Duty Managers, tracking and record keeping.

Cost/benefit of electronic equipment does not pencil out for a facility our size.

Easy to print out self-inspections. Two forms- electronic and paper for FAA inspection.

Made the most sense, accomplished the task and meets regulatory requirements.

Operations personnel currently use a paper self-inspection checklist. The checklist contains a map with gridlines.

These tools allow us to effectively document our findings during a self-inspection. Friction testing equipment is necessary to gauge the slickness of the runway during the winter months. The self-inspection checklist that we utilize includes an airport diagram which allows us to pinpoint a discrepancy on the diagram and allow the Field Maintenance Department to correct the discrepancy.

Our inspection information is recorded in a computer-based log program. We print the form from the previously completed inspection to use as a guide and to note any changes. We also keep airport diagrams in vehicles to note any specific areas, and then we transfer the information to the computer based log system once back in the office. Each operations employee is provided with a blackberry to enhance the recording of information.

A grip tester is used to develop Mu readings. The other is all that we have available to us.

It's what we have in place. Technology is on its way. They were tools we thought might help at the time. We use ground and air temperature sensors and a GRT during winter ops. The GRT records all test runs and eliminates any human interpretation.

Friction tests are regulatory. Vehicles are due to length of runways, taxiways, ramps. Currently use paper inspections and are switching to computer mounted in vehicles.
Improved accuracy and record keeping.
Funding and regulatory requirements.
We will use any equipment and material available to aid our staff in conducting inspections thoroughly and safely. We want to provide any tools they need to identify, mitigate, minimize and/or eliminate hazards on the airfield.
With only one runway, this is sufficient for our operation.
Easiest, not fancy.
Simple.
Simple.
We don't have enough in our budget and the personnel that conduct self-inspections have many other things on their plate and paper seems to work fastest.
We are moving toward a GPS/vehicle mounted device. Imagery is contracted periodically.
The PDA and camera are used to document discrepancies to create work requests.   The checklist used when opening or closing area for construction.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

CHAPTER 4—REPORTING DISCREPANCIES AND FINDINGS

CFR Part 139.327 requires "procedures, facilities, and equipment for reliable and rapid dissemination of information between the certificate holder's personnel and air carriers." Please explain how this is accomplished at your airport.

We still have FSS's here and we issue NOTAMS. If the discrepancy is long term, we ask the FAA to make a change in the 5010.
NOTAM issuance procedures include fax, telephone, and email.
We have a direct phone line to all the tenants at the airport. If we have a message to relay to them, we can do it in one call. We are also able to send a fax to all the tenants in one group.
Web site and e-notam.
NOTAMS are fax and emailed. Phone calls are made and face to face conversations are conducted if warranted.
Fax blasting advisories out to tenants.
Varies per airport.
Via fax and e-mail distribution.
We use a combination of phone, fax and email.
Field condition reports and other important information (i.e. NOTAMS) are distributed by email to all air carriers, contractors, air traffic control, and other interested parties.
E-Notams, our Website, and hard copies delivered.
We have a network broadcast fax system.
The Operations staff communicates with air carrier personnel via OpsNet software. OpsNet is used for issuing NOTAMs and communicating information about the Airport's status to air carrier personnel. Air carrier personnel have access to OpsNet via the internet and email updates which are automatically sent out as Airport conditions change.
Call down lists, NOTAMs, and construction notices/operations notices.
Through email, fax, hotline recording, and person to person hand delivered notifications.
IROPS web site.
Reports from airport personnel to our FSS is passed on by radio and read back for validity. FSS then disseminates the information. Electronic information reporting system PASSUR
High Speed Notification System "Communicator." Web-based secure internet 24 x 7 field condition reporting application "PASSUR Ops net."
Electronic delivery.
Proprietary Program with email and fax dissemination capability.
Unsatisfactory conditions that cannot be promptly corrected by our maintenance department shall be identified and disseminated by NOTAM in accordance with 139.339 Airport Condition Reporting. NOTAMs will be filed through the Lockheed Martin FSS and faxed to all affected tenants. A Code Red paging and telephone alerting system can also be utilized if a situation or condition has an immediate negative impact to the operations of the airport.

Phone calls, fax, E-NOTAM, ATCT.
NOTAMS.
Fax out when conditions change.
Sent by fax, to tower.
NOTAM is faxed and emailed.
Email internal and fax outside, as well as hotline to listen to NOTAMS
I fax all my info to air carriers and FBOs. I now have a fax that can handle multiple numbers at once this is done electronically from my computer.
We use Flight Information Display System to provide NOTAMs to air carriers. We also use FAX to provide the same information.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

FAR Part 139.327 also requires "a reporting system to ensure prompt correction of unsafe airport conditions noted during the inspection." Please explain how this is accomplished at your airport.

We utilize a work order system. If the condition poses an immediate hazard to aircraft, we contact airport maintenance via phone and have them respond accordingly. This is a judgment call made by self-inspectors.
We have a computerized work order system. As soon as we notice a discrepancy, we submit an electronic work order and note the urgency of the problem. If necessary, we also issue a NOTAM.
Electronic work order database.
Written work requests to Job Control.
Varies per airport.
Maintenance work order system. Work order can be issued by radio, telephone or e-mail. Work order status is communicated back via same methods depending on severity of issue.
Emergency repairs are reported directly to maintenance; other 139 issues are reported to the Control Center, entered in to our reporting system then forwarded to the proper maintenance unit.
Part 139 issues are resolved with real-time coordination with the airport's in-house maintenance department. A written work order system is use to track issues and resolve them.
Either correct the issue immediately or NOTAM the item.
Discrepancies are electronically distributed to the appropriate parties and then tracked in an Excel spreadsheet.
The Operations staff enters discrepancies into a maintenance service order system which is used to notify Airport Facilities of unsafe conditions. Airport Facilities works with Operations to make repairs.
Computer based log system with capabilities to enter work orders, have them screened, and have them closed out when corrections are made.
Computerized Airport Log System (CALS).
Eagle integrated systems electronic checklist system and work order system.
Same application as above linked to in-house maintenance management (work order) application and tracking.
Immediate notification and correction (via radio).
Proprietary Program with email and fax dissemination of Maintenance requests.
Any unsatisfactory conditions noted during an inspection will be recorded on the airport's approved inspection checklist. A phone call is made to the on-duty Airfield Maintenance staff for unsatisfactory conditions requiring action to be taken, and a follow-up e-mail is completed and routed to the Airfield Maintenance staff (and copied to the Airside Operations staff).
Maintenance Order based on seriousness of the condition. High priority conditions are repaired immediately
Daily inspector has authority to have crew fix any problems immediately.
Phone call to maintenance, depending on severity-pick up radio or work order
Immediate--contact airfield maintenance over radio. For routine, reported on airfield inspection form, and once entered, it sends to AFM supervisor.
If urgent, we radio maintenance. Back at office, we issue a work order.
We use a work request system to correct discrepancies.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

CHAPTER 5—FOLLOW-UP AND CLOSE-OUT

In what manner are items reported on the self-inspection properly closed out?

There is a column in the Airport Self Inspection Report where we log the date and time that the discrepancy was closed out. Where applicable, NOTAMs are closed.
The discrepancy is tied to a work order number and the work order identifies the time and date the discrepancy was corrected
Electronic work order system tells us if it's complete. We then verify on the next inspection to ensure it has been completed. If not, we make a phone call and submit a secondary work order.
Notation of NOTAM log
DSI's and work orders are attached once a work item is closed out.
There probably isn't any follow up other than the person who writes up the discrepancy is the one who is fixing the discrepancy.
Items on the self-inspection checklist will correlate with a work order. Airport maintenance closes out the work order when the item is complete. The work order is not deleted but its status is changed from pending to complete.
Varies per airport.
When notification to operations manager that problem is resolved and that operations manager confirms item is closed.
When it has been signed off by Operations
Sign off is required by the maintenance superintendent and operations supervisor.
Work order and initials by the Supervisor that verified the item was in fact corrected/fixed.
Electronic, voice or personal notification that the discrepancy has been fixed.
Maintenance service orders are printed and reviewed periodically. It is the responsibility of the inspector (Operations employee) to insure items are closed out.
After Operations personnel inspect the correction and authorize the maintenance supervisor to electronically close the work order.
In CALS by Ops supervisor
Marked when back in service.
Systems allow person originated to inspect and close out.
Work orders issued are immediately acknowledged as received. The assigning of work to proper trades and tracking (updates) are all recorded on subsequent notes to original work order. There is an escalation process in place for 24, 48 hr, weekly and longer term resolution. Then inspection by trades supervisor and electronic note to operations personnel with final inspection by Ops staff duty mgr.
Electronic work order system with physical verification.
By reporting parties manual closure after inspection.
As our maintenance fixes/repairs the reported unsatisfactory condition they will notify Airside Operations via phone, two way radio, or by email from our maintenance department. We also will field verify during routine surveillance throughout the course of the day.
Identified on the self-inspection sheet and work orders with Operations Manager.
Supervisor signs off when work is complete and inspected.
Verbally tell us. Paper sheet completed once closed out.
Log in and see if closed-web based.
Can log in and see the status.
They are initialed on the original inspection sheet once they are taken care of.
Items are closed out via electronic work order request system.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

At what point is an issue (discrepancy) considered closed out?

When the discrepancy is fixed.
When the work order is closed and the discrepancy is resolved.
After it has been visually inspected.
When it is resolved to the safest condition possible without major overhaul.
When the DSI and work order are attached.
When it is corrected and no longer a discrepancy.
Varies per airport.
When verified that work is complete.
Once operations personnel have verified completion of the work order.
When the Operations Supervisor verifies that the item has been corrected/fixed.
When it is no longer a discrepancy.
An issue is considered closed-out after the required correction has been made and the inspector has re-inspected the area to ensure compliance.
When it is corrected.
After Operations personnel have given authorization for the close out.
When closed out in CALS by an OPS Supervisor.
When the unsafe condition has been resolved.
When re-inspected.
NOTAM or Work Order canceled or actually closed out in database.
When it meets standards
When the work is completed or deemed unnecessary.
When the reported condition is corrected and compliant with the required 139 standards.
Operations Manager signs off on the close out
When it is fixed so it meets 139 mandates
Check system for close-outs.
When it is completed.
When the work has been completed.

CHAPTER 6—QUALITY CONTROL

How does your airport ensure quality control concerning the self-inspection process (to include training, inspecting, and documenting)?

Inspection reports are maintained. Crews are briefed on discrepancies. We include training and sometimes the personnel check each other's quality of inspection. Sometimes the FAA humbles us.
If complacency exists, it will be addressed in employee reviews. We encourage self-inspectors to take ownership and get them to buy into maintaining the airport's track record of positive FAA reviews.
With so many of us conducting the inspections, we are able to ensure things have not been overlooked.
Ops Supervisors are assigned to review/check certain assigned months.
Quality control is the airport manager's responsibility.
Audits, training, management oversight, and awareness.
By periodic audits and supervision.
Training and oversight.
Quality control is achieved by communication between all parties, verifying quality and auditing reports to help identify areas that need improvement.
Training is documented in accordance with Part 139 requirements. All Part 139 work orders are retained by the operations department for review and recordkeeping.
Training, inspecting, and documenting.
The manager audits the airfield for discrepancies.
Daily review of the inspections.
Daily monitoring of actions taken. Sufficient time to debrief the next shift.
Ops manager goes out and rides along.
Management oversight and coordination, auditing, redundant reviews.
Routine audit (monthly).
Training, inspecting, documenting.
By conducting weekly/monthly audits to ensure nothing falls through the cracks or is overlooked or omitted. The airside 139 qualified officers are also given individual "ownership" responsibilities pertaining to sections of 139. These individuals will coordinate with Airside Supervisors and the Manager to ensure inspection follow-up and closure is completed, the training program is up to date and documentation is 139 compliant, 365 / 24-7
Through annual training, schools, classes. Follow up by Airfield Maintenance Supervisor.
Training.
The airport manager reviews the inspection sheets on occasion.
Documenting training and inspection reports.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and airport identifiers removed.

APPENDIX H

Open-Ended Responses by FAA Certification Inspectors

Based on your knowledge of Part 139 airports in your region, what are some of the best practices for training self-inspection personnel you've discovered?

-FAA Self-Inspection DVD - On-the-job training at other 139 airports with exceptional self-inspection programs - sharing lessons learned. - Industry training courses and outreach (i.e., ASOS Schools, Conferences, etc.)
Airports that create in-house self-inspection training programs using photos of their own airfields in concert with other self-inspection training resources are usually more successful with their self-inspection programs.
Combination of On-the-job training/simulator training/classroom and outside (ASOS) training programs.
Regular self-inspection training, including reviews of FAA ACs and conducting mock 139 inspections in-house (by assigning an employee to act as if they were doing the FAA inspection). Developing airfield-specific training programs with actual pictures of the airfield and pictures of discrepancies versus corrected items. PowerPoint presentations and testing. Hands-on training is one of the best tools. After someone reads about it in the ACs, allow them the opportunity to go to other airports and conduct inspections with other people that do the same job. Networking with other airports.
-Combining class room with electronic training aids and hands on practical experience. -Closure of a runway or taxiway system to allow time for a detail training session for inspectors, maintenance, ARFF and other related departments. -Assigning individual inspectors subject instruction responsibilities. This process requires the individual to study the subject material to be able to teach it.
-Power Points generated locally and by Central Region. -Counseling Airport Managers/Operations persons during the inspection process. -Outreach programs for airports in a workshop format.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and identifiers removed.

In what manner, if any, do your region's expectations differ from 14 CFR Part 139.303 and 139.327?

In accordance with the regulations.
Our region's expectations mirror .303 and .327.
None.
No difference.
We require the training programs to provide the individuals with the knowledge and skills necessary for the individual to correctly perform their assigned task and responsibilities.
Airport familiarization, as an example, is more than knowing the color of markings. Each individual must know the type of marking, the correct name, and location of each marking used on the airport. The same is true for signs and lighting. Training requirements are based on the level of responsibility. The higher the level of responsibility, the more in-depth and detailed the training requirements. Training curriculums and training programs are required for each assigned task, including fuel safety inspections and wildlife control.
139.303 and 139.327 are guidance and points of departure for our inspection process. "If you are not doing these things and keeping a record, we have a problem."

Note: Comments are verbatim with the exception of spelling/grammatical corrections and identifiers removed.

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Specifically, how can airports strengthen their self-inspection programs, to include training of personnel conducting self-inspections?

If there are problems with an airport's self-inspection program, the airport should be reaching out to other 139 airports with exceptional programs.
Use a variety of training materials and techniques. Ensure that airports know that well-rounded self-inspection training should include knowledge of the law, the Airport Certification Manual and the associated Advisory Circulars.
Reference material must be provided during training. Advisory Circulars should be at the core of training.
Send personnel to other airports, in addition to in-house training. Looking for the same things at another airport sometimes reinforces the requirements and makes them stand-out more than seeing the same airfield day-in and day-out. Make all personnel develop presentations and present the subject to their peers. Once you are forced to "teach" a subject, you tend to learn it more.
Airports can strengthen their self-inspection program by becoming more knowledgeable about the assigned task requirements. Airport management in general does not understand the knowledge requirements of each individual. We have been suggesting that airports, whenever possible, develop a personnel training program based on hiring or assigning an individual(s) with the education and background in training requirements. Airports that have taken this approach and that have provided the training coordinator with the hands on experience have been very successful in meeting their training requirements. Airports must be willing to provide the resources and funding to properly address this requirement
Airports must have the intent, personnel and resources, or we have an uphill situation. Generally, airports understand the safety concerns and the liability exposure. We counsel them on this, in addition to identifying the requirements of 14 CFR Part 139. As noted above, if we (the FAA) would commit the personnel, money and time to conduct outreach workshops it will strengthen the airport self-inspection program greatly.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and identifiers removed.

Based on your knowledge of Part 139 airports in your region, what are some of the best <u>self-inspection practices</u> you have discovered?

- If staffing allows, rotating inspectors responsible for the self-inspections brings a more diverse and robust self-inspection program. - Ensure self-inspections are completed during both daylight and hours of darkness. - Conduct in-depth focus inspections outside of the daily inspections to target certain areas (pavement, safety areas, signs, lighting, obstructions, etc.). - Outreach to other 139 airports and conduct site visits to airports to establish best practices.
One successful practice we have observed at large airports involves assigning specific training topics to individual Operations staff members. Each staff member becomes responsible for creating and presenting the training for that particular subject. This creates "ownership" of the topic--that individual becomes the "guru" for a specific training area and the resulting training programs reflect the pride of "ownership."
Utilization of computer software to help manage work orders and NOTAMs, as well as construction activity noted during self-inspections.
Conducting inspections slowly. Conducting the runway inspection near the edge, up and down on both sides. Then, once down the center. (3 passes total). Not staying on the taxiway centerlines during taxiway inspection. Getting out of the vehicle and walking the runway and taxiway safety areas. Multiple airfield inspections per day. Slow moving FOD inspections. Computer-based and web-based electronic inspection tools with GIS mapping and electronic work-order systems.
-Using non-standard inspection patterns. -Establishing standards to determine when a condition is no longer acceptable, such as a collection of sign panels in varying degrees of deterioration or photographs of marking conditions. -Adopting the new technology for conducting the daily inspections. The new technology tracks the progress of the inspection against a check list, identifies the location of a discrepancy, develops the work order, and records the correction date. -Inspecting runway lighting on step 1. This method emphasizes the differences in the brightness of the bulbs and gives a better indication of alignment problems and other associated problems
Both daytime and nighttime inspections. Periodically driving and walking the Safety Areas. If possible, close movement areas for more detailed inspections.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and identifiers removed.

Please share any additional information regarding self-inspections, training personnel to conduct self-inspections, and your office's oversight of these.

Airports should consider the self-inspection program the key to FAR Part 139 compliance. Where there are deficiencies in the self-inspection program, we see systemic breakdowns in 139 compliance. When we reach a point of identifying serious issues, we often will recommend that airport visit other 139 airports with established and well managed self-inspection programs.
The once a year inspection only provides a snap shot. Airports will typically assign the same position to ride along with the inspector. It's encouraged that personnel be rotated in order to observe the Part 139 Inspection process.
Self-inspection training is often lacking when fire department personnel are dual tasked with firefighting duties as well as conducting airfield inspections. Their inspections usually turn into lighting and FOD checks instead of true self-inspections. Self-inspections are often done by vehicles driving too fast and they don't find things they should be. People don't normally get out of the vehicle and miss many safety deficiencies that they may easily see by walking on foot. Pictures say a lot and are one of the best tools for training personnel on what they need to be looking for.
We work closely with our airports to help them address and develop their personnel training programs. In doing so, we keep an open door perspective for questions and request suggestions. We do not take the approach that we only regulate with no interaction required. We put a great deal of effort in maintaining a balance of enforcement with education and resource support.
A comprehensive checklist with an airport diagram and a method of showing closed discrepancies is a good tool. Many of the more sophisticated airports are converting to electronic data programs for this.

Note: Comments are verbatim with the exception of spelling/grammatical corrections and identifiers removed.

APPENDIX I

Self-Inspection Checklist (Courtesy of St. Cloud Regional Airport)

AIRPORT SAFETY SELF-INSPECTION CHECKLIST

DATE: _____ DAY: _____ ✓ Satisfactory
X Unsatisfactory

Day Inspector/Time: _____ Night Inspector/Time _____

FACILITIES	CONDITIONS	D	N	REMARKS	RESOLVED BY (initia & date)
Pavement Areas	Pavement lip over 3"				
	Hole - 5" diam. 3" deep				
	Cracks/spalling/heaves				
	FOD: gravel/debris/sand				
	Ponding/edge dams				
Safety Areas	Ruts/humps/erosion				
	Drainage/construction				
	Support equipment/aircraft				
	Frangible bases				
	Unauthorized objects				
Markings	Clearly visible/standard				
	Runway markings				
	Taxiway markings				
	Holding position markings				
	Glass beads				
Signs	Standard/meet Sign Plan				
	Obscured/operable				
	Damaged/retroreflective				
Lighting	Obscured/dirty/operable				
	Damaged/missing				
	Faulty aim/adjustment				
	Runway Lighting				
	Taxiway Lighting				
	Pilot Control Lighting				
Navigational Aids	Rotating beacon operable				
	Wind indicators				
	VASI/PAPI/REIL systems				
Obstructions	Obstruction lights operable				
	New cranes not reported				
Snow & Ice	Surface conditions				
	Snowbank clearance				
	NAVAIDS				
Construction	Barricades/red lights				
	Equipment parking/materials				
	Complying Plans & Specs				
	Confusing signs/marking				
Public Protection	Fencing/gates/signs				
	Jet blast problems				
Wildlife Hazards	Wildlife present/location				
	Complying with WHMP				

Original Date: 12/9/04   FAA Approval: _____

Revision Date: _____   Exhibit 12 Page 1 of 1

APPENDIX J

Self-Inspection Checklist (Courtesy of Dane County Regional Airport)

DAILY AIRFIELD INSPECTION REPORT

DATE:

TIME:

INSPECTOR:

☐ SATISFACTORY

☑ DISCREPANCY

	DISCREPANCY	CORRECTIVE ACTION TAKEN

A. AIRFIELD LIGHTING
1. Runway Edge Lights ☐
2. Runway Centerline Lights ☐
3. Threshold Lights ☐
4. Taxiway Lights ☐
5. Guidance Signs ☐
6. REIL ☐
7. VASI / PAPI ☐
8. Approach Lights / MALSR ☐
9. Guard Lights ☐
10. Rotating Beacon ☐
11. Wind Sock ☐
12. Obstruction Lights ☐
13. Fuel Storage Area ☐
14. Apron Edge Lights ☐
15. Security Lights ☐

B. PAVEMENT AREAS
1. Pavement Lip over 3" ☐
2. Hole 5" Diameter/3" Deep ☐
3. Cracks/Spalling/Bumps ☐
4. FOD ☐
5. Vegetation Growth ☐
6. Low Spots ☐

C. SAFETY AREAS
1. Runways ☐
2. Taxiways ☐

D. PAVEMENT MARKINGS
1. Runways (Markings) ☐
2. Taxiways (Markings) ☐
3. Ramps ☐

E. OTHER
1. Construction Area ☐
2. AOA Fencing/Gates/Signs ☐
3. Wildlife Hazards ☐
4. Braking Action ☐
5. Snow and Ice ☐
6. NAVAID Security ☐
7. Fueling Operations ☐

Number   Subject

Date Issued

APPENDIX K

Field Condition Report (Courtesy of Dane County Regional Airport)

FIELD CONDITION REPORT (FCR)

MSN Operations Contact Number:
Office - (608) 246-3397
Mobile - (608) 235-1001

DANE COUNTY REGIONAL AIRPORT
MADISON

NOTAM #

ISSUE DATE

ISSUE TIME

ISSUER

FSS ISSUE

RUNWAYS	PAVEMENT CONDITION	MU VALUES (ERD)			
		APCH	MIDPT	ROLL	TIME
18/36					
3/21					
14/32					

TAXIWAYS

ALPHA

BRAVO

CHARLIE

DELTA

ECHO

HOTEL

JULIETT

KILO

FOXTROT

GOLF

RAMPS

SOUTH

WEST

EAST

TO VIEW THE CURRENT FIELD CONDITION REPORT 24 HOURS A DAY, VISIT WWW.MSNAIRPORT.COM/OPERATIONS/FCR.ASPX

APPENDIX L

Sample Work Order Form (Courtesy of Cherry Capital Airport)

CHERRY CAPITAL AIRPORT

Operations Work Order

Supervisor requesting work to be completed: Brian Edwards   Date: 7/4/10

Please indicate items needing attention

Pavement Area	
------------	Location:
------------	Location:

Safety Areas	
------------	Location:
------------	Location:

Signs & Markings	
------------	Location:
------------	Location:

Obstructions	Location:
------------	Location:

Airfield Lighting & Nav. Aids	
Wind sock	Location: RWY 10 WINDSOCK UNLTD
------------	Location:

Construction	
------------	Location:
------------	Location:

ARFF	
------------	Location:
------------	Location:

Other	
------------	Location:
------------	Location:

Issuing Work Order:

☒ Issue NOTAM if applicable
☒ Indicated in Daily Self Inspection
☒ Work not completed on shift
☒ Advise following shift if work not completed

Completed Work Order:

☐ Cancel NOTAM if applicable
☒ Indicated in Daily Self Inspection

Original Date: 11/01/2004
FAA Approval:

APPENDIX M

Airport Safety Self-Inspection Flyer (Courtesy of New Hampshire DOT)

AIRPORT SAFETY SELF-INSPECTIONS

WHO...

Airport sponsors of FAA-obligated airports are required by Grant Assurance #19 to operate their airport "at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable federal, state, and local agencies for maintenance and operation," as well as NH RSA 422:17.

For airport sponsors of NH registered airports that don't fit the definition above, they are required to meet NH RSA 422:16 and RSA 422:17 such that the airport conforms to minimum standards of safety and that safe air traffic patterns are available.

WHAT...

Airport safety self-inspections are one method for reducing or eliminating accident risks at airports. These inspections are required at all FAA-obligated airports. They are useful for maintaining airport safety, as evidence, and for identification of

WHAT...

Key inspection items include, but are not limited to, the following:
- foreign object debris (FOB)
- inoperative navigational aids
- obstructed/inoperative visual aids
- safety mechanisms functioning
- other security concerns

HOW...

An airport safety self-inspection is a visual inspection of the aircraft operating area (AOA) and includes documentation for the files.

Each airport is different. Airport safety self-inspection programs should be tailored to meet the needs of an individual airport. Common sense is key to developing this program.

Daily inspections are usually adequate but should be supplemented as needed with additional inspections as conditions change. Conditions that might warrant an additional inspection could include, but are not limited to the following: receipt of a complaint, weather event, wildlife in the vicinity of the AOA, and security breach.

Sample inspection checklists are available. Use Notices to Airmen (NOTAMs) as needed.

APPENDIX N

Excerpt from AC 150/5200-18C

Entire AC can be accessed at www.faa.gov

COMPONENTS OF A SAFETY SELF-INSPECTION PROGRAM. A successful safety self-inspection program has four components:

A regularly scheduled inspection of physical facilities (which must be conducted daily at airports certificated under Part 139 or in accordance with the FAA-approved airport certification manual). If the airport serves air carriers after dark, there should also be a nighttime inspection of lighting;

Continuous surveillance inspection of certain airport activities, such as fueling operations, construction, airfield maintenance;

A periodic condition inspection program for such things as surveying approach slopes, obstructions, etc.; and

Special condition inspections during unusual conditions or situations, such as changing weather or days of unusually high number of aircraft operations.

REGULARLY SCHEDULED INSPECTION. The regularly scheduled inspection consists of specific observations of airport physical facilities on at least a daily basis. This inspection should concentrate on the areas described in this section, which are also included in Appendix 1. If deficiencies exist, the inspector should indicate the deficient item and identify its location on a airport sketch, providing dimensions and depths, as necessary. If appropriate, the inspector should take photographs to document the condition.

a. **Pavement Areas.** The condition of pavement surfaces is an important part of airport safety. Pavement inspection should be conducted daily before flight operations commence to ensure pavement surfaces are clear. As a minimum, a daily inspection should be performed of all paved areas that are the responsibility of the airport operator or as specified in the FAA-approved Airport Certification Manual. During the pavement inspection, the inspector should:

Check the pavement lips—the area between full-strength pavement and shoulders or paved shoulders and safety areas—to assure that they are no greater than necessary to allow water to drain off the pavement. A lip height no greater than 1½ inches is usually sufficient to allow proper drainage. (At airports certificated under Part 139, pavement lips shall not exceed 3 inches as stated in § 139.305.)

Determine if there are any cracks wide enough to cause directional control problems for an aircraft. Report and monitor these cracks.

Determine if there are any holes that could cause directional control problems for an aircraft. (At airports subject to Part 139. any hole that cannot be covered by a 5-inch circle, and the side slope at any point in the hole that exceeds 3 inches in depth and is 45 degrees or greater, is a discrepancy. If the hole cannot be covered by a 5-inch circle but the side slope at any point in the hole that exceeds 3 inches in depth or is less than 45 degrees, it may be a discrepancy if it is determined to be a surface variation that could impair directional control of an air carrier aircraft.)

Check the condition of pavement areas for cracks, scaling, spalling, bumps, low spots, and for debris that could cause foreign object damage to aircraft.

Check for vegetation growth along runway and taxiway edges that may impede drainage from the pavement surface.

Check for vegetation growth in cracks.

Report and monitor any cracks, holes, variations and vegetation that can cause loss of aircraft directional control or may cause pavement damage, including damaged caused by damming or ponding water.

b. Safety Areas. The inspector should know the dimensions of the runway and taxiway safety areas at the airport. At airports certificated under Part 139, the dimensions of the safety areas should be documented in the airport certification manual. During the safety area inspection, the inspector should:

Determine if there are any hazardous ruts, depressions, humps or variations from the normal smooth surface.

Check to ensure no object is located in a safety area, except objects that must be in the safety areas because of their functions (such as runway lights, signs, or navigational aids). These objects must be constructed on frangibly mounted structures of the lowest practical height. At Part 139 airports, the frangible point must be no higher than 3 inches above grade.

Determine if the base for any equipment in safety areas is at grade level (especially during the winter thaw) and equipment and NAVAIDs mounted on frangible couplings.

Check to ensure that manhole and handhole covers are at grade level and can support vehicles and aircraft. Check to ensure that mounts for light fixtures are at grade level.

Check for surface variation and other damage caused by rodents or other animals.

Report any objects that are not frangible or not at grade level. Also report extraneous equipment and objects, such construction equipment, and surface variations that would cause damage to an aircraft or impede emergency response vehicles. At airports certificated under Part 139, issue a NOTAM regarding objects in the safety area contrary to § 139.309 (see § 139.339)

c. Markings. Airport markings provide important information to pilots during takeoff, landing, and taxiing. To avoid confusion and disorientation, airport markings should be in compliance with FAA marking standards specified in AC 150/5340-1, Standards for Airport Markings. (Compliance with these standards is mandatory for operators of airports certificated under Part 139 and for airport operators that have accepted Federal funds for runway and taxiway construction/ rehabilitation.) The inspector should know the appropriate markings required at the airport. During the marking inspection, the inspector should:

Check markings for correct color-coding, peeling, blistering, chipping, fading, and obscurity resulting from rubber buildup.

Check to see if all runway hold position markings are clearly visible.

During and after construction projects, check new markings for compliance with FAA marking standards.

If the markings have glass beads, check markings during periods of darkness to determine if the reflectivity of glass beads is adequate at night.

Report and monitor any nonstandard marking or markings that are obscured, faded or deteriorating.

d. Signs. Signs provide important information to pilots while taxiing. To avoid pilot confusion and disorientation, airport signs should be in accordance with FAA sign standards specified in AC 150/5340-18, Standards for Airport Sign Systems. (Compliance with these standards is mandatory for operators of airports certificated under Part 139 and for airport operators that have accepted Federal funds for runway and taxiway construction/rehabilitation.) The inspector should know the appropriate sign standards and specifications at the airport and at a Part 139 certificated airport, ensure signs comply with the FAA-approved Sign Plan.

Check signs to ensure they are easy to read, in accordance with color standards, retro-reflective, and that all lighted signs are working and not obscured by vegetation, dirt, snow, etc.

Check signs to ensure they are frangibly mounted and concrete bases are properly maintained at grade level.

Check to see that sign panels are not missing or damaged, that they have the correct legend and arrow orientation, and that they are not cracked or broken.

During and after construction projects, check new signs for compliance to FAA sign standards and, at Part 139 airports, in accordance with the FAA-approved Sign Plan.

During periods of darkness, check signs to ensure they are properly illuminated. Ensure mandatory instruction signs are illuminated with the associated runway lighting system. Check signs for correct operations; that they are on the correct circuits, they do not flicker and that they follow the intensity setting of the runway or taxiway lights.

Report and monitor any nonstandard sign or any sign that is not functioning, is faded or damaged. At airports certificated under Part 139, issue a NOTAM regarding any malfunctioning holding position sign or ILS critical are sign, as specified under §139.339

e. Lighting. At night and during periods of low visibility, lighting is important for safe airport operations. Lights come in different shapes, sizes, colors, and configurations and can be located either in the pavement or along its edges. Inspection of lighting is best accomplished during periods of darkness in order to evaluate lighting systems when they provide the primary visual aid for pilots. The inspection should concentrate on the lighting owned by the airport operator. However, the inspector should observe any lighting owned or operated by others and report any observed problems immediately to the appropriate responsible owner. During the lighting inspection, the inspector should:

(1) Check to ensure that the following are operable, if installed, and that vegetation or deposits of foreign material do not obscure the light fixture.

Runway and taxiway edge lights;

Apron edge lights;

Runway centerline and touchdown zone lights;

Taxiway centerline lights or centerline reflectors;

Runway threshold/end lights; and

Runway guard lights (both elevated and in-pavement, if installed).

(2) Check that the following are operable, if installed:

Ramp lights and floodlights used in construction to ensure they are properly shielded;

Obstruction lights; and

Lighting in fuel storage areas.

Report all fixtures missing and lights that are not working or appear dim.

Report any missing or broken light fixture lenses.

Ensure that runway and taxiway lights and runway threshold lights are the proper color and are oriented correctly.

Check that lights function properly through the manual or radio control features, and that photocell controls function properly.

Check the lights for proper alignment, aiming and correct changes in intensity, for correct height, erosion around the bases and the height of frangibility.

f. Navigational Aids (NAVAIDs). The inspection of NAVAIDs should concentrate on the visual navigational aids owned by the airport operator. However, the inspector should observe any navigational aids owned or operated by others, such as the FAA, and report any observed problems immediately to the NAVAID owner. During the inspection of NAVAIDs, the inspector should:

Determine if the segmented circle is clear of vegetation and that it can be seen easily from the air.

Determine if the airport rotating beacon is visible and working properly.

Check the wind cone(s) to ensure that it swings freely, the cone fabric is not faded or frayed, and, if lighted, that all lights are operating.

Determine if the Runway End Lights (RENLs, formerly known as Runway End Identifier Lights) are flashing in proper sequence and mounted on frangible couplings.

Check Visual Glide Slope Indicators (VASIs, PLASIs, or PAPIs) to ensure that their lights are working and mounted on frangible couplings.

Determine if the Approach Lighting systems are functioning properly.

Report and monitor any NAVAID that is malfunctioning, inoperable or misaligned, damaged or missing.

g. **Obstructions.** The inspection of obstructions should concentrate on a visual check of construction underway on or near the airport that could affect aircraft operations. This also includes checking for any vegetation, especially trees that may penetrate the Part 77 surfaces. During the inspection of obstructions, the inspector should:

Check to ensure that construction equipment, especially tall cranes being used at construction sites, are not an obstruction. If construction is found and thought to create an obstruction, the airport operator should determine if proper notification to FAA, such as is required through Part 77 or Airport Layout Plan review, has been provided.

Determine if obstructions are properly marked and lighted.

Direct any person proposing construction near a public-use airport meeting the notice requirements contained in Part 77, Objects Affecting Navigable Airspace, to the Air Traffic Division or Airports District Office immediately if their construction has not been reported to the FAA.

Report and monitor any obstruction light that is missing, inoperative or damaged, and any object that appears to be an obstruction and is not properly marked or lit.

h. **Fueling Operations.** The daily inspection on aircraft fueling operations should concentrate on a quick inspection for the most common problems concerning compliance with local fire safety codes at fuel storage area s and with mobile fuelers. The inspection should also include security, fire protection, general housekeeping, and fuel dispensing facilities and procedures. A more detailed fueling operation inspection should be scheduled quarterly (see Quarterly Fueling Operations under Periodic Condition Inspection). During the daily inspection of aircraft fueling operations, the inspector should:

Determine if the fueling operator is permitting any unsafe fueling practices or is in violation of local fire code, such as failure to bond aircraft with the mobile fuelers during fueling operations or fueling personnel smoking while fueling aircraft.

Check to ensure that the appropriate signs for the fuel farm are installed and that all gates are locked except when the facility is occupied by an authorized user.

Report and monitor any unsafe fueling practices and violation of local fire codes. At Part 139 airports, report any noncompliance with fuel fire safety procedures specified in the FAA-approved Airport Certification Manual.

i. **Snow and Ice.** The inspector should be familiar with the airport's snow and ice removal procedures and guidance provided in AC 150/5200-30, Airport Winter Safety and Operations. At Part 139 certificated airports, the inspector should be familiar with the airport's FAA-approved Snow and Ice Control Plan. During the snow and ice control inspection, the inspector should:

Determine if any lights and signs are obscured by snow or damaged by snow removal operations.

Check to ensure that snow banks and drifts next to the runway and taxiways provide clearance for aircraft wing tips, engines, and propellers.

Check to ensure that snow is not piled across the runway threshold or across runway/runway intersections.

Check to be sure that no foreign objects are left on the pavement from snow removal operations.

Check to ensure that snow removal operations have not blocked any taxiways or access routes dedicated for aircraft rescue and firefighting equipment.

Check to ensure that snow is not accumulated or piled in the critical areas for electronic NAVAIDs.

Check for and report slippery pavement conditions in terms of either braking action or MU values. If a friction measurement device is available, issue the appropriate numbers obtained from the equipment. (Do not attempt to correlate friction measurement numbers with braking action reports.)

Report and monitor any snow and ice accumulation that has been missed by the snow and ice removal operation, and any dangerous condition created by such operations, such as obscured signs or lights. At airports certificated under Part 139, issue a NOTAM regarding snow, ice, slush or water on the movement area or loading ramps, and parking areas, as specified under § 139.339.

j. **Construction.** The inspector should be familiar with the airport's construction safety procedures and guidance provided in AC 150/5370-2, Operational Safety on Airports During Construction. At Part 139 certificated airports, the inspector should be familiar with the airport's FAA-approved Construction Safety Plan. During the construction inspection, the inspector should:

Determine if stockpiled material and construction materials are properly stored to keep them from being moved by wind, jet blast, or prop wash, and is not left in safety areas or movement area.

Check all construction adjacent to movement areas to ensure areas are identified with conspicuous marking and lighting.

Determine if construction equipment (such as bulldozers, cranes, etc.) are marked and lighted and parked clear of the safety areas.

Ensure construction barricades are properly positioned to define the limits of construction and hazardous areas and, if barricades are lighted, check to ensure lights are working properly and are positioned correctly.

Check to ensure that debris and foreign objects are continuously being picked up around construction areas.

Check for open trenches in the safety areas or adjacent to movement areas.

Check operation of lighting in areas adjacent to construction daily before the construction crews depart for the day. In particular, ensure that mandatory instruction signs remain lit with the associated runway lights, even on taxiways that have been closed for construction.

Check NOTAMs daily during construction projects to ensure they accurately reflect the conditions on the airport.

Verify that closed taxiways or runways are properly marked and lighted.

Report and monitor any dangerous condition created by construction activity, including damage to signs, lights, markings and NAVAIDS or equipment and supplies left in movement areas and safety areas.

k. **Aircraft Rescue and Firefighting.** During the inspection of aircraft rescue and firefighting (ARFF) capabilities, the inspector should:

Check the status of ARFF response, including the availability of equipment, fire fighters and extinguishing agent. At Part 139 airports, ensure that such ARFF capabilities comply with the FAA-approved Airport Certification Manual and that the airport's ARFF Index is still appropriate for air carrier aircraft served.

Ensure alarm and emergency notification communication systems are operable.

Determine the adequacy of available fire extinguishing agents.

Check for construction or maintenance activity on the movement area that could affect ARFF response routes. Ensure that the ARFF Department has been notified if construction or maintenance activity could affect emergency response routes.

Report and monitor any ARFF vehicle, equipment or extinguishing agent that is not available or inoperative; any ARFF personnel that are not available; and any changes to aircraft that may require a change to ARFF capabilities. At Part 139 airports, notify the FAA if ARFF vehicles is inoperative and cannot be replaced immediately, as specified under § 139.319(g) and issue a NOTAM regarding non-availability of any rescue and firefighting capability, as specified under § 139.339.

l. **Public Protection.** During the public protection inspection, check gates, fencing, locks, and other safeguards are in place and functioning properly to prevent inadvertent entry to movement areas by unauthorized persons and vehicles and offer protection from jet blast. Report and monitor any safeguards that are damaged or missing. In accordance with the airport's security plan, report unauthorized persons or vehicles in the movement area (airports regulated by the Transportation Security Administration may have additional requirements for reporting and responding to unauthorized persons and vehicles).

m. **Wildlife Hazard Management.** During the wildlife hazard inspection, the inspector should check for evidence of birds or animals on the runways, taxiways, aprons, and ramps or other signs that wildlife problems may have developed—such as large flocks of birds on or adjacent to the airport. Wildlife hazards found during the daily self-inspection should be properly documented. All dead wildlife found and all wildlife aircraft strikes should be reported to the FAA on the FAA Form 5200-7, Bird/Other Wildlife Strike Report. This form may be obtained from the FAA Internet site, at **www.faa.gov**. Additionally, the inspector should check fencing and gates for wildlife accessibility and should ensure that wildlife control equipment is available and operational.

CONTINUOUS SURVEILLANCE INSPECTION. Continuous surveillance inspection consists of general observation of activities for compliance with regulations, procedures, etc., as well as abnormalities with physical facilities that are readily apparent. This is performed any time inspection personnel are on the air operations area. Continuous surveillance of airport physical facilities and activities should cover at least the areas described in this section, which are also included in Appendix 2.

a. **Ground Vehicles.** During the continuous surveillance inspection of ground vehicles, the inspector should:

Determine if vehicle drivers are following the airport's procedures and arrangements for the orderly operations of ground vehicles (including mowing machines or other maintenance vehicles in the safety areas). Extra attention should be paid to ground vehicle activity during construction, winter operations, and other special events.

Report and monitor any vehicle operator that is not complying with the airport's vehicle procedures and arrangements.

Report any ground vehicle accident observed and any ground vehicle signs and markings that are damaged, missing or obscured.

b. **Fueling Operations.** The inspector should:

Emphasize fire and explosion hazards inherent in aircraft refueling.

Ensure proper bonding is being used, deadman controls are not blocked, and no smoking prohibitions are being observed, and aircraft are not being fueled inside hangars.

Check for proper parking of mobile fuelers to ensure these vehicles are at least 10′ apart and 50′ from buildings.

Check for fuel leaks or spills in the fuel storage area and around mobile fuelers.

Determine if the fuel farm is free of flammable materials, including litter and vegetation.

Report and monitor any of unsafe fueling conditions discussed above and other obvious violations of local fire code and airport fuel fire safety procedures.

c. **Snow and Ice.** During the continuous surveillance inspection of snow and ice removal operations, the inspector should check snow or ice covered pavements and report and monitor any surfaces where snow and ice may affect the safety of aircraft operations. In addition, the inspector should monitor snow and ice removal NOTAMS to ensure they remain current and issue timely corrections, as necessary. If the airport uses other means to notify tenants of snow and ice removal operations, e.g., faxed or electronic messages, the inspector should also monitor this information for accuracy. Check to ensure that snow or ice on pavement surfaces does not affect the safety of aircraft operations and that NOTAMS are current.

d. **Construction.** The Inspector should check construction projects to ensure that the contractor is following the construction safety plan. During the continuous surveillance inspection of construction activity, the inspector should check for, and report, any of the following conditions:

Unauthorized use of runways, taxiways, and aprons by construction personnel and equipment.

Conditions that may result in runway incursions and other irregularities. This includes ensuring that construction areas are delineated appropriately with barricades, cones, markings, etc.

Construction equipment is not operated in ILS/MLS critical areas unless coordination with FAA has been accomplished.

Perimeter gates are left open and unattended, unlocked or construction vehicles and personnel are not following access and escort procedures.

Construction vehicles not properly marked or missing appropriate flags and/or beacons.

Foreign object debris on haul roads adjacent to movement areas that can be tracked onto taxiways, aprons, and ramp areas.

Confusing or missing signs, markings or lighting that could potentially confuse or mislead pilots.

Barricades and lighting are in place and operational.

e. **Public Protection.** Pay special attention to public protection during construction and special events. During the continuous surveillance inspection of safeguards used to protect the public, the inspector should check for, and report, any of the following conditions:

Unauthorized personnel, vehicles, and animals, particularly in areas aircraft passengers and the general public are present on the air carrier ramp and other portions of the movement area, i.e., remote aircraft parking locations.

Inoperable or blocked gates, particularly those that would impede access by aircraft rescue and firefighting equipment.

Open or unlocked gates and missing or damaged signs posted to prevent unauthorized access to the airfield.

Damaged or missing jet blast fences.

f. **Wildlife Hazard Management.** During the continuous surveillance inspection of wildlife hazards, the inspector should check for, and report, any of the following conditions:

Birds or animals, such as dogs, deer, etc., on or adjacent to the runways, taxiways, aprons, and ramps to determine if there is a potential wildlife hazard problem.

Potential hazard created by birds on or adjacent to the airport.

Wildlife strikes and carcasses found on the runways. Report these on FAA Form 5200-7, Bird/Other Wildlife Strike Report. This form may be obtained from the FAA Internet site at **www.faa.gov**.

g. **Foreign Object Debris (FOD).** The inspector should continuously check for, and remove any FOD in movement areas, aircraft parking areas and loading ramps.

PERIODIC CONDITION INSPECTION. Periodic condition inspections consist of specific checks of physical facilities on a regularly scheduled basis (but less frequently than daily). Checks may require use of equipment (e.g., Walker Bar to measure VASI glide slope angles or transit to survey approach slopes, or continuous friction measurement equipment) or checking specific features of physical facilities. Periodic inspection of airport physical facilities and activities should cover at least the areas described in this section, which are also included in Appendix 3.

    a. Pavement Areas. The inspector should check pavement surfaces for rubber buildup, polishing, or other items affecting friction.

    b. Markings. The inspector should:

        Check pavement markings to ensure they are correct and clearly visible. Markings on concrete and faded asphalt should be outlined with a black border.

        Determine if markings are visible at night, especially examine for rubber buildup in the touchdown zone areas.

    c. Signs. The inspector should check signs faces for peeling and for fading or faded colors.

    d. Quarterly Fueling Inspections. Airports certificated under Part 139 are required to establish fire safety standards for safe fueling operations and conduct quarterly inspections of the fueling facilities. The inspection procedures in this section are based on the NFPA 407 fire code for airport fueling operations, which is one of the more common fire codes in effect at certificated airports. The fire safety standards for fueling operations should be listed in the Airport Certification Manual (ACM) and the quarterly inspections should be conducted for compliance to the fueling fire safety standards listed in the ACM. Sample quarterly inspection checklists for fuel storage areas and mobile fuelers are included in Appendix 5. Typical fire safety standards to inspect quarterly are listed below. Airports certificated under Part 139 are required to maintain a record of this inspection for at least 12 months.

    (1) Fuel storage areas and loading/unloading stations. The inspector should:

        Check fuel storage areas for adequate fencing and security to prevent unauthorized access or tampering.

        Check for "No Smoking" signs that are clearly visible.

        Check fuel storage areas for materials such as trash or vegetation that could contribute to the spread of fire. Also check for equipment, functions or activities that could be ignition sources.

        Note if fueling equipment appears to be in good operating condition and free of fuel leaks.

        Check piping for reasonable protection from damage by vehicles if piping is above ground.

        Check fuel storage areas for at least two accessible and serviceable fire extinguishers. Where the open hose discharge capacity of the equipment if more than 200 gallons per minute, at least one wheeled extinguisher with at least 125 lbs of agent is also required.

        Check for explosion proof equipment, switches and wiring that is reasonably protected from heat, abrasion or impact, which could cause an ignition source.

        Check for piping, filters, tanks and pumps being electrically bonded together and interconnected to an adequate grounding rod.

        Check for a serviceable bond/ground wire with clip at each loading/unloading facility for grounding tankers and mobile fuelers.

        Check loading stations for deadman control features.

        Look for a boldly marked emergency cutoff capable of stopping all fuel flow with one physical movement. The emergency cutoff should be located outside the probable fuel spill area near the route that normally is used to leave the spill area or to reach the fire extinguishers.

(2) **Mobile fuelers.** At least once every 3 months, inspect all fuel trucks to ensure they meet fire safety standards. The inspector should:

Note if mobile fuelers appear to be in good operating condition and free of fuel leaks.

Check mobile fuelers for parking at least 50 feet from a building and at least 10 feet from each other. Note: Some airports have a mobile fueler maintenance building that is approved by the local fire marshal.

Check for flammability decals on all sides. Lettering should be at least 3 inches high. Also check for hazardous materials placards on all sides. The Hazmat number for Jet A trucks should be #1863 and #1203 for 100LL trucks.

Check the cab for a "No Smoking" sign and the presence of smoking equipment. Ashtrays and cigarette lighters are not to be provided.

Check for two fire extinguishers, accessible from each side of the mobile fueler. Fire extinguishers should be charged, sealed and tagged from the last fire extinguisher inspection. Check dry chemical extinguishers to ensure they are only B-C rated. ABC rated multipurpose dry chemical extinguishers are not to be used on mobile fuelers as they are highly corrosive to aircraft and can cause significant damage to aircraft engines.

Check emergency fuel cutoffs to ensure they are boldly marked and operable. There should be an emergency fuel cutoff accessible from each side.

Check electrical equipment, switches, wiring and tail light lens covers for explosion proof construction and reasonable protection from heat, abrasion or impact which could be an ignition source.

Check for serviceable bonding wires and clamps.

Check nozzles for deadman control feature.

Check the vehicle exhaust system for exhaust leaks and for adequate shielding if it extends under the fuel tank portion of the vehicle.

e. **Navigational Aids.** Periodically check the aiming of REILs and Visual Glide Slope Indicators owned by the airport.

f. **Lighting.** The inspector should:

Determine that power generator and circuit resistance tests are being conducted.

Ensure lights with adjustable optical systems are checked for proper aiming.

g. **Obstructions.** The inspector should:

Check to ensure there are no overhead power lines in the aircraft parking areas.

Annually survey trees and other structures near the airport that could affect glide path angles, approach light lanes, or be an obstruction to Part 77 surfaces.

h. **Aircraft Rescue and Firefighting.** The inspector should:

Periodically determine if the aircraft rescue and firefighting equipment is capable of meeting response times, if it is required under Part 139.

Ensure that recurrent training and hot-fire drills are being conducted as required by Part 139.

Check to ensure the availability of adequate entry tools.

SPECIAL CONDITION INSPECTIONS. Special condition inspections occur after receipt of a complaint or as triggered by an unusual condition or event. A special inspection should be conducted after an accident or incident. Depending upon circumstances, special condition inspections may include the

inspection of any of the specific facilities or activities under the other three components. A special condition inspection of airport physical facilities and activities should cover at least the areas described in this section, which are also included in Appendix 4.

a. **Pavement Areas.** After a rain or thunderstorm, the inspector should check the pavement areas for ponding and edge damming.

b. **Markings and Signs.** The inspector should:

Determine if markings are visible at night especially when the pavement is wet following a rain.

After construction or maintenance operations, ensure that pavement markings are correct.

c. **Safety Areas.** The inspector should:

Ensure that the storm sewer system is checked to verify that inlets are not clogged and drainage channels are free of debris. Note any standing water.

Ensure all inlet covers are in place and sewer covers are at grade level.

Conduct a special inspection before reopening a runway or taxiway following any construction or maintenance that has been performed in or around that safety area.

Any time an aircraft has left the pavement and entered a safety area, check to ensure that no ruts or holes have been made by the aircraft tires or by personnel and equipment during the recovery operation.

Check for construction and maintenance activities to ensure that no hazardous conditions have been created (equipment left in safety areas, unacceptable pavement lips created by ground alteration work, ruts from mowing equipment, etc.).

Inspect engineered materials arresting system (EMAS), if installed, for damage and for deterioration.

Physically drive or walk the safety areas to check for any discrepancies.

d. **Snow and Ice.** Several special inspections may be needed during a winter storm until the airport is back to a normal operation. The inspector should:

Check to ensure that all foreign objects have been picked up after snow and ice removal operations.

If a friction measurement device is available, issue the appropriate numbers obtained from the equipment. Do not attempt to correlate friction measurement numbers with braking action reports. If a friction measurement device is not available, issue to Air Traffic braking action reports.

Conduct a special sign inspection after snowstorms for signs that may have been damaged by plows or by snow thrown by blowers.

e. **Construction.** The inspector should:

Ensure that construction areas are barricaded and lighted properly.

Check construction equipment to ensure that they are parked within the pre-arranged areas.

Conduct night inspections to ensure that barricades, warning lighting, and reflectors are adequate to keep aircraft away from the construction area.

Check the location of construction material and stockpiles to ensure that they are outside of safety areas and do not block any signs.

Check any movement areas adjacent to construction areas or movement areas traversed by construction vehicles to ensure there is no FOD present.

Check movement areas around construction sites for potentially confusing marking, lighting, and signs that could cause pilot confusion or result in a runway incursion.

f. Surface Movement Guidance and Control Systems (SMGCS).

For operations below 1,200 feet runway visual range, the inspector should conduct an initial inspection of stop bar lights, runway guard lights, clearance bar lights, taxiway centerline lights, and taxiway edge lights installed on the low visibility routes in accordance with the airport's SMGCS plan.

SMGCS lighting systems that are not electronically monitored should be periodically inspected every 2 to 4 hours for during operations below 1,200 feet to 600 feet. For operations below 600 feet, these inspections should take place every 2 hours. Such inspections should be detailed in the airport's SMGCS plan.

Abbreviations used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

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ISBN 978-0-309-14347-9

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